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SECOND SERIES: PULMONATA.

MANUAL

OF

CONCHOLOGY;

STRUCTURAL AND SYSTEMATIC.

WITH ILLUSTRATIONS OF THE SPECIES.

BY GEORGE W. TRYON, JR.
CONSERVATOR OF THE CONCHOLOGICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Vol. IV.

HELICIDÆ:—Vol. II.

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MANUAL OF CONCHOLOGY.

FAMILY *HELICIDÆ*, Vol. II.

Genus HELIX, Linn.

Group VII, HELICELLA.

Section II, XEROPHILA.

(Continued from Vol. III, p. 169.)

Subsection V. CANDIDULA, Kobelt. 1871.

Conoidally depressed, periphery rounded. H. CANDIDULA, Studer. *European, Asiatic.*

It is *Helicopsis*, Fitz. in part.

Subsection VI. LEMNISCIA, Lowe. 1854.

Subimperforate, trochoidal or globosely conoidal, periphery carinate; whorls 6–7, planate; peristome acute, reflected and thickened towards the axis. H. MICHAUDI, Desh. *Madeira*, H. MONILIFERA, Webb and Berth. *Canary Is.*

Monilearia, Mousson, 1872, is a synonym.

Subsection VII. XEROLEUCA, Kobelt. 1877.

Sublenticular, granosely striate, periphery laciniately carinated, umbilicus wide, funnel-shaped, bordered by a carina. H. TURCICA, Chemn. *Northern Africa.*

Subsection VIII. TURRICULA, Beck. 1837.

Conical, umbilicated or perforate, costulate-striate, cretaceous white, often fasciate, periphery angulated or carinated; peristome labiate within. H. PYRAMIDATA, Drap. *Mediterranean Region.*

Obelus, Hartmann, *Irus*, Ads., *Trochula*, Mörch, and *Crenea*, Albers (in part), are synonyms.

Subsection IX. COCHLICELLA, Risso. 1826.

Bulimiform, narrowly perforate, whitish, fasciate, periphery subangulate; peristome simple, acute, margins converging. H. ACUTA, Müller. *Mediterranean Region.*

Elisma, Leach, is a synonym.

Section III. Ochthephila, Beck. 1837.

Small, perforate or narrowly umbilicated, depressed, rounded or disk-like, periphery with extremities approaching or continuous.

Madeira, Azores.

Subsection I. Ochthephila (sensu stricto).

Usually scaly, granular or ribbed, last whorl keeled, periphery keeled or continuous. H. echinulata, Lowe.

Hystricella, Lowe. 1854, is a synonym.

Subsection II. Geomitra, Swainson. 1840.

Shell mamilliform. H. thiarella, Webb. et Berth.

Coronaria, Lowe. 1854, is a synonym.

Subsection III. Heterostoma, Hartmann. 1844.

Shell planorbiform. H. obtecta, Lowe.

Spirorbula, Lowe. 1854, is a synonym.

Subsection IV. Irus, Lowe. 1854.

Shell trochiform. H. abjecta, Lowe.

Placentula, Pfr. 1855, is a synonym.

Subsection V. Placentula, Lowe. 1854.

Shell depressed orbicular. H. Maderensis, Wood.

Section IV. Actinella, Lowe. 1854.

Narrowly umbilicated to scarcely perforate.

Depressed globose, last whorl keeled, not descending in front, aperture oblique, often with a fold-like swelling. H. compacta, Lowe. *Madeira.*

Rimula and *Caseolus* (in part), Lowe and *Lyrula*, Wollaston, are synonyms.

Section V. Tectula, Lowe. 1854.

Umbilicated or perforate, depressed pyramidal, solid, roughly sculptured, last whorl keeled, with a swollen inner lip.

H. Lyelliana, Lowe. *Crenea*, DePaiva (in part), is a synonyn.

Section VI. Craspedaria, Lowe. 1854.

Widely umbilicated, pitted, the last whorl plicate at the suture, spirally sculptured on the periphery and around the umbilicus, descending in front to a nearly horizontal aperture, with continuous expanded periphery. H. delphinula, Lowe.

Section VII. Discula, Lowe. 1854.

Pyramidal, umbilicated, rather solid, roughly granularly sculptured, somewhat babylonic, periphery obtusely keeled. H. cheiranthicola, Lowe.

Obelus, Hartmann, *Turritella*, Woll., and *Crenea*, Lowe (in part), are synonyms.

Section VIII. Callina, Lowe. 1854.

Covered perforate, striate, and granular, periphery sharply keeled, keel vanishing behind the aperture. H. rotula, Lowe.

Section IX. Acusta, Albers. 1860.

Shell globose, thin, umbilicated, last whorl large, swollen, rounded, peristome simple, sharp. H. Sieboldiana, Pfr.

Japan.

The group is Chinese and Japanese in distribution. It is *Armandia*, Ancey, in part; other species of that group being *H. Davidi*, *H. Moupiniana* and *H. plicatilis*, which I have described under Macrochlamys, Vol. II, 103.

Subsection V. Candidula, Kobelt. 1871.

H. protea, Ziegler. Pl. 1, figs. 1, 2.

Narrowly umbilicated, whitish, often maculately banded; whorls 5–6, convex, the last large; peristome acute, slightly labiate within. Diam. 11 mill.

Ins. Corfu.

It is *H. obvia*, Jan, *H. campestris*, Ziegler and *H. pustulata*, Muhlf.

H. apicina, Lam. Pl. 1, figs. 3–5.

Rather narrowly umbilicated, somewhat flattened above, more convex beneath, striated, whitish, the apex variegated with corneous, suture deep; whorls 4–4½, convex, the last dilated in front; peristome subsimple, acute. Diam. 7 mill.

Southern Europe, Azores, Tangiers.

H. cenisia, Charp., *H. lauta*, Reeve, and *H. hispidula*, Risso, are synonyms.

H. Cupani, Calcara, is probably a juvenile.

Var. Ramburi, Mabille.

Somewhat larger, whitish, obsoletely fasciate with brown, irregularly costate-striate; whorls 5–5½, more slowly increasing, apex more elevated; umbilicus narrower. Diam. 9–10 mill.

France, Crimea.

H. subapicina, Mousson. Pl. 1, figs. 6, 7.

Narrowly perforate, thinly, sharply striate, greyish white, with light corneous striæ, bands or maculations, suture slightly impressed; whorls 4½, convex, the last not descending in front, rounded below; peristome acute, not labiate. Diam. 5 mill.

Mogador, Morocco.

H. obruta, Morelet. Pl. 1, figs. 8, 9.

Narrowly perforate, angulated, obsoletely striate, chalky, corneous strigate and marbled with white, with reddish spiral lines, suture impressed; whorls 5½, a little convex, the last angulated above, rounded below; peristome simple, acute. Diam. 8 mill.

Ins. Sta. Maria, Azores; subfossil.

H. Reboudiana, Bourg. Pl. 1, figs. 10–14.

Narrowly umbilicated, solid, opaque, chalky, greyish white, flamed with fulvous, with irregular whitish costulations; whorls 6, slightly convex, rapidly increasing, with impressed suture, last whorl dilated, rounded, convex below, descending in front; peristome acute, slightly labiate within, margins approximating. Diam. 10 mill.

Algiers.

Replaces in N. Africa the *H. candidula* of Europe.

H. Lallemantiana, Bourg. Pl. 1, figs. 15–17.

Perforate, thin, a little translucent, whitish, with brownish corneous interrupted zones above, forming irregular maculations, and 5–7 continuous narrow bands below, lightly costulate, suture linear; whorls 6, scarcely convex above, rapidly increasing, the last suddenly, slightly deflected in front, periphery obtusely angulated; peristome acute, rosy-lipped within. Diam. 10 mill.

Algiers.

H. Geryvillensis, Bourg. Pl. 1, figs. 18–20.

Perforate, fragile, whitish, often with three or four corneous zones, obliquely costulate; whorls 6, slightly convex, suture impressed, last whorl large, the periphery obsoletely angulated, not deflected in front; peristome acute, slightly labiate within, margins approximating. Diam. 9 mill.

Algiers.

H. Bargesiana, Bourg. Pl. 1, figs. 21–23.

Moderately umbilicated, striate, irregularly interruptedly banded, or with a white band; whorls 6½–7, slowly increasing, the last rounded, not deflected in front; peristome white, acute, or slightly internally thickened. Diam. 14 mill.

Syria.

H. striata, Müller. Pl. 1, figs. 24, 25.

Moderately umbilicated, closely, rather sharply costulate, a little shining, white, sometimes fasciate and radiate with brown, base white-banded, apex corneous; whorls 4½–5, slightly convex, rather rapidly increasing, the last wider, rounded, scarcely descending in front; peristome acute, very thinly labiate within. Diam. 9·5 mill.

Middle Europe.

H. costulata, Ziegler, and *H. Narbonensis*, Requien, are synonyms.

Var. Nilssoniana, Beck.

Apex depressed, whorls more convex, bands obsolete, sometimes wanting. Diam. 8·5 mill.

Sweden.

H. Bardoensis, Bourg. Pl. 1, figs. 26–28.

Moderately umbilicated, solid, chalky, rugosely striate, whitish, sometimes bilineate with black, or with seven interrupted, faint black bands, lineated towards the aperture; whorls 6, slightly convex, slowly increasing, the last rounded, scarcely descending at the aperture; peristome simple, acute, deeply labiate within.

Diam. 10 mill.

Tunis.

H. profuga, Schmidt. Pl. 1, figs. 29, 30, 34, 35.

Moderately umbilicated, closely, regularly costulate-striate, whitish, often with interrupted chestnut bands, apex corneous; whorls 5–5½, convex, the last obsoletely angulated, not descending in front; peristome acute, brown lipped within. Diam. 12 mill.

Mediterranean Countries.

It is *H. striata*, Drap., *H. caperata*, Pfr., *H. fasciolata*, Moq. Tand., *H. fimbriata* and *H. Apennina*, Chiereg.

Var. Attica, Böttger.

With a broad continuous band. Diam. 8–10 mill.

Greece.

Var. variegata, Mouss.

More conical, the whorls less convex, striæ less distinct, white, with spots and rays.

Epirus.

H. PARABLETA, Böttger. Pl. 1, figs. 31–33.

Narrowly umbilicated, somewhat solid, smooth, white, with a superior chestnut band, and an interrupted one within it, base with a broad band, and several narrow ones within it; whorls 5, very slowly increasing, with deep suture, closely irregularly striated, last whorl with more or less distinctly angulated periphery, base convex; peristome simple, labiate within, margins approaching.

Diam. 6 mill.

Nachitschewan, alluvion of the Araxes.

H. BOLLENENSIS, Locard. Pl. 1, figs. 36–38.

Narrowly umbilicated, solid, thick, smooth, opaque, strongly, irregularly, somewhat undulately striate, greyish white, usually unicolored, sometimes with interrupted pale brown bands, often scarcely visible; whorls 6, very convex, the last well rounded, a little dilated towards the aperture; peristome simple, white-lipped within.

Diam. 13–15 mill.

Southern France.

Locard has indicated varieties *depressa*, *minor* and *fasciolata*.

H. LAURACINA, Fagot. Pl. 2, figs. 55–57.

Rather narrowly umbilicated, solid, chalky, thick, subopaque, with strong undulating striæ, close, irregular, sometimes not continuous, stronger above, yellowish or yellowish white, usually without bands, sometimes with faint, subcontinuous chestnut bands, varying in number; whorls 4½–5, slightly convex, slowly increasing, suture deep, last whorl a little flattened above at the aperture; peristome acute, with a yellowish or chestnut interior callus.

Diam. 11–14 mill.

Southern France.

H. PERROUDIANA, Locard. Pl. 2, figs. 58–60.

Moderately umbilicated, solid, thick, chalky, subopaque, with rather close, undulated striæ, weaker below, yellowish white or greyish, usually without bands, sometimes with faint chestnut bands on the middle and below, varying in number, nearly obsolete towards the umbilicus; whorls 4½–5, convex, with deep suture, last whorl a little inflated at the aperture, somewhat depressed above and below; peristome acute, with a thick interior callus.

Diam. 10–12 mill.

Southern France.

H. TRICASTINORUM, Florence. Pl. 2, figs. 61–63.

Rather narrowly umbilicated, solid, thick, cretaceous, subopaque, with close, undulating striæ, equally strong below, yellowish white to reddish yellow, without or with chestnut bands varying in number, thin, not continuous, faint, especially towards the umbilicus; whorls 4½–5, with moderate suture, increase at first slow, but rapid in the last whorl; peristome acute, with a slight whitish or rosy interior thickening. Diam. 12 mill.

Southern France.

H. FEDTSCHENKOI, Mart. Pl. 2, figs. 64–66.

Widely umbilicated, slightly striate, whitish, spire scarcely elevated; whorls 4½, convex, with rather deep suture, last whorl rounded, slightly descending in front; peristome acute.

Diam. 15 mill.

Kulikalan, Turkestan; alt. 9500 ft.

H. MERIDIONALIS, Parr. Pl. 1, figs. 39, 40.

Differs from *H. profuga*, Schm., in its flatter form, stronger striæ and wide umbilicus.

Dalmatia, Corfu.

Is *H. striata*, var. of Rossmassler.

H. SUBSTRIATA, Clessin. Pl. 1, figs. 41–43.

Moderately umbilicated, rather solid, striulate, shining, milk-white, unicolored or banded with chestnut; whorls 5, slowly, regularly increasing, convex, with deep suture, last whorl rounded, not descending in front; peristome acute. Diam. 11 mill.

Crimea.

H. SUBCOSTULATA, Bourg. Pl. 2, figs. 67–69.

Perforate, chalky, whitish, the earlier whorls obscurely maculated with corneous, irregularly strongly costulate, suture impressed; whorls 6, convex, the last bluntly angulated, slightly descending at the aperture; peristome simple, acute. Diam. 5–6 mill.

Algiers.

H. AGRIOICA, Bourg. Pl. 2, figs. 70–72.

Narrowly umbilicated, chalky, whitish, with a few translucent corneous maculations above and below, distantly costulate above, sculpture weaker on the base, suture impressed; whorls 6, the last bluntly angulated, suddenly deflected at the aperture; peristome acute, white-lipped within. Diam. 7 mill.

Algiers.

H. ACUTISTRIA, Böttger. Pl. 2, figs. 73–75.

Moderately umbilicated, white, unicolored, or with a single chestnut band above and five interrupted narrow bands below; whorls 5, rapidly increasing, with deep suture, convex, closely covered with thread-like striæ, last whorl scarcely descending, obtusely angulated, angle vanishing towards the aperture; peristome simple, acute, remotely white-lipped within. Diam. 9–10 mill.

Tiflis, Transcaucasia.

This species has been recently referred to *H. crenimargo* (Vol. III, p. 252), as a var. *obtusior.*

H. CANDIDULA, Studer. Pl. 1, figs. 44–48.

Narrowly umbilicated, minutely striate, whitish, unicolored or variously banded with brown; whorls 4½–5, slightly convex, the last scarcely deflected in front; peristome acute, internally thickened. Diam. 9 mill.

Middle Europe.

The synonyms are *H. unifasciata,* Poir., *H. bidentata,* Drap., *H. striata,* Var. Drap., *H. graphica, H. rugellosa,* and *H. striatula,* Hartm., *H. azona, H. unizona* and *H. radiolata,* Andrz., *H. elegans,* Fleming.

Var. ALPICOLA, Stabile.

Small, cretaceous, globosely depressed, rather thin, with narrow, pale, interrupted bands, evanescent, aperture more rounded.

Diam. 6·5 mill.

Var. THYMORUM, Alt.

Turbinately depressed, obtuse, more or less striate, porcellanous or yellowish, with a chestnut band above, and sometimes with inferior lines; last whorl flattened above, obtusely angulated, convex below; peristome white-lipped within.

Var. GRATIOSA, Ziegler.

Shell much larger.

H. strigatula, Hartm., and *H. adnumerata,* Parr., are synonyms.

Var. SPIRILLA, Westerl.

Narrowly umbilicated, depressed, costulate-striate, yellowish, usually with a superior chestnut band; whorls 4½–5, the last dilated, planate above, obtusely angulated, base convex; aperture angulated above and below, widely 2–3 labiate within, columella short, forming an angle with the basal lip. Diam. 4·6 mill.

Southern France, Sicily.

Var. VORTEX, Westerl.

Globosely convex, densely costulate; whorls 5, slowly increasing, convex, the last scarcely larger; aperture rounded lunar.

Diam. 5–5·5 mill.

Southern France.

Var. ALBOCINCTELLA, Colb.

Shell brownish, the fasciations confluent, with a median white line.

Belgium.

Var. NAMURCENSIS, Colb.

Shell whitish with a band of chestnut dots on the periphery, appearing again above the suture, and two additional spiral series, very faint, on the base.

Belgium.

Var. LUNULATA, Kryn.

Striolate, angulated above, white, sometimes with chestnut bands and lines, spire a little more elevated, umbilicus narrower; whorls 6, rounded; peristome patulous, lipped within.

Odessa.

Var. MELLÆ, Pini.

Small, somewhat depressed, more rugose, with wide bands above or below.

H. RUGOSIUSCULA, Mich. Pl. 2, figs. 76, 77.

Moderately umbilicated, closely, elegantly costulate-striate, greyish, apex corneous; whorls 5, a little flattened above, the last scarcely angulated, convex below; peristome acute, strongly lipped within. Diam. 6 mill.

Taragon, Central Pyrenees.

H. PALADILHII, Bourg. Pl. 2, figs. 78–80.

Rather narrowly umbilicated, somewhat closely unequally costulate, whitish, with a single interrupted brown band above the periphery, apex light corneous; whorls 5, slightly convex, slowly increasing, the last scarcely descending in front, barely angulated, convex below; peristome acute, scarcely labiate within.

Diam. 8 mill.

Montpellier, France.

H. CYPARISSIAS, Parr. Pl. 1, fig. 49.

Moderately umbilicated, closely costulate-striate, white, punctate or irregularly maculated and subfasciate with chestnut, apex cor-

neous; whorls 5, convex, the last narrow, not descending in front; peristome acute, thinly labiate with chestnut. Diam. 6 mill.

Ins. Cyprus.

H. ARROUXI, Bourg. Pl. 2, figs. 81, 82.

Umbilicated, depressed, fragile, subpellucid, thinly striulate, fulvous chestnut maculated with white, with a shining, blackish apex; whorls 5½, a little convex, suture well impressed, last whorl obscurely subangulated, base convex. Diam. 6 mill.

Berytus, Syria.

Following Pfeiffer, I included this species in Patula (Vol. III, 21), but it is evidently more closely related to the present group.

H. IMPROBATA, Mousson. Pl. 1, figs. 50–52.

Widely umbilicated, unequally, strongly striate, white, greyish or with punctate corneous lines; whorls 5, flattened above, rounded below, the earlier and middle ones distinctly filosely carinated, the last with the angle evanescent, irregularly deflected; peristome acute, labiate within. Diam. 13 mill.

Around Jerusalem.

H. CONSPURCATA, Drap. Pl. 1, figs. 53, 54.

Narrowly umbilicated, costulate, hairy, horny ash color, minutely variegated; whorls 4–5, depressed; peristome acute. Diam. 6 mill.

Southern Europe, Algiers, Teneriffe.

It is *H. radiolata*, Jan, and *H. Sardiniensis*, Porro. *H. Aetnœa*, Benoit is a juvenile of this species.

Var. ILLUVIOSA, Nevill.

"An apparently constant form, differing conspicuously in the character of the epidermis, and slightly in those of the shell itself." No other description given.

Mentone, France.

Var. PSARA, Bourg. Pl. 3, figs. 89–91.

Rather widely umbilicated, subopaque, dull, strongly irregularly striate, earlier whorls brownish, with white maculations, last whorl uniform brownish corneous; whorls 5, rapidly increasing, the last rounded, scarcely, slowly descending in front; peristome simple, acute. Diam. 8 mill.

Algiers.

H. LETOURNEUXIANA, Bourg. Pl. 3, figs. 92–94.

Narrowly umbilicated, rather thin, subopaque, ash color with chestnut maculations disposed in an interrupted spiral zone, costu-

late striate; whorls 6, slightly convex, slowly increasing, the last with angulated periphery, not descending in front, convex below; peristome simple, acute. Diam. 8 mill.

Algiers.

H. EUSTRICTA, Bourg. Pl. 2, figs. 84, 85.

Moderately umbilicated, whitish, with corneous maculations above, disposed as in a serpent's skin, below all white, or with three usually interrupted narrow corneous bands, closely striate above, more strongly so below; whorls 5, the last subcarinate, scarcely, slowly descending in front, base convex, somewhat inflated round the umbilicus; peristome simple, acute. Diam. 5 mill.

Algiers.

H. LOCHEANA, Bourg. Pl. 3, figs. 95–97.

Rather narrowly umbilicated, thin, slightly pellucid, striulate, and when living clothed with very short, rigid hairs, greyish white, with ashy brown flames at the suture or on the base, or more usually several bands, flamed with whitish; whorls 5, convex, the earlier ones carinate in young individuals, the last large, rounded, usually with a whitish peripheral band, not descending at the aperture; peristome simple, acute, slightly labiate within. Diam. 5 mill.

Algiers.

H. MORICOLA, Paladilhe. Pl. 2, fig. 83.

Rather narrowly umbilicated, thin, fragile, with short, somewhat recurved hairs, and slightly flexuous regular striæ, brownish, spotted with greyish white; whorls 5, slightly convex, with well-impressed suture, last whorl obtusely angulated on the periphery, base convex, with white spots formed of concentric lines; peristome acute.

Diam. 4 mill.

Dep. Herault, France.

Smaller, with narrower umbilicus, deeper suture and rounder aperture than *H. conspurcata.*

H. INTERSECTA, Mich. Pl. 2, figs. 86–88.

Narrowly umbilicated, closely costulate-striate, opaque, whitish gray or dark brown, rarely unicolored, usually interruptedly banded, maculated, or punctate with fulvous or chestnut color; whorls 5–6, slowly increasing, the last obsoletely angulated, shortly descending in front; peristome simple, chestnut- or white-lipped within.

Diam. 8 mill.

So. France, N. Spain.

H. ignota, Mabille is a synonym.

H. JAYLEI, Paladilhe.

Widely umbilicated, depressed, subdiscoidal, regularly rugosely costulate, somewhat chalky, whitish straw-color, apex somewhat rosy; whorls 5½, slightly convex, rapidly increasing, the last large, a little descending in front; aperture suboblique, rounded-lunar, peristome simple, acute, labiate within, margins approaching.

Diam. 12 mill.

Tangiers.

Var. RUSTICULA, Palad.

Umbilicus narrower, spire more elevated, apex smaller, blackish, costulations stronger, more irregular, whorls more convex above, more rapidly increasing. Diam. 14 mill.

Tangiers.

Paladilhe, after pointing out the differences between this form, which he describes as a species, and *H. Jaylei*, thinks it not improbable that they will prove identical. Kobelt reduces *rusticula* to the rank of a variety. I am unable to figure the species because my copy of the work containing the description is incomplete, in wanting the plate referred to in the text.

H. SUBMERIDIONALIS, Bourg. Pl. 3, figs. 98–100.

Narrowly umbilicated, whitish, with five interrupted chestnut zones, strongly striate; whorls 6, scarcely convex above, rapidly increasing, the last rounded, slightly descending in front; peristome acute, brown-lipped within. Diam. 10 mill.

Algiers.

This specific name was originated for an assemblage of species now recognized as distinct, and is better limited to the Algerian form figured by its author, as typical; perhaps should be suppressed altogether.

H. CAPERATA, Mtg. Pl. 3, figs. 1, 3–5, 12, 13.

Moderately umbilicated, closely striate, whitish or yellowish with brownish or corneous bands, maculations or interrupted strigations; whorls 6, slightly convex, slowly increasing, the last not deflected, base more convex, peristome white-lipped, acute.

Diam. 8–11 mill.

Western Europe.

It is *H. striata*, Drap. (in part), *H. crenulata*, Dillw., *H. fasciolata*, Drouet, *H. intersecta* of numerous authors.

Var. BARCINENSIS, Bourg. Figs. 3–5.

Narrowly umbilicated, irregularly plicate-striate, ashy white or light brownish, fasciated and maculated with chestnut, smoother

below; whorls 5½, convex, the last slightly deflected in front, periphery subangulated; peristome acute, white-lipped within, margins approximating. Diam. 10·5 mill.

Miranda, Spain.

The synonyms are *H. Mirandæ* and *H. Iberica*, Rambur.

Var. DINIENSIS, Rambur. Figs. 12, 13.

Moderately umbilicated, very thinly, regularly striate-costulate, whitish or ash colored, with brown lines and bands; whorls 5½, slowly increasing, the last subdeflected in front, base more convex; peristome thin, white-lipped within, margins approximating.

Diam. 12 mill.

Southern France.

H. LANGLOISIANA, Bourg. Pl. 3, figs. 6–8.

Umbilicated, somewhat solid, crispately rugulose above, striate below, white, unicolored or with subconfluent bands and strigations above, apex light corneous; whorls 5, slightly convex, the last wider, scarcely descending in front, periphery subangulated; peristome acute, widely white-lipped within, margins approaching.

Diam. 10·5 mill.

Syria.

It is *H. caperata*, Var. Kobelt's Catalogue.

H. ARMILLATA, Lowe. Pl. 3, figs. 9–11.

Moderately umbilicated, thin, costulate, obsoletely spirally striate, brownish corneous, marbled and subfasciate with whitish, suture impressed; whorls 5, subplanate, the last not deflected in front, carinated above, base convex, subcompressed round the umbilicus; peristome simple, acute, margins distinct. Diam. 7–8 mill.

Madeira, Azores.

The synonyms are *H. striata*, Lowe, *H. conspurcata*, Mouss., *H. Lowei*, Pot. et Mich.

H. MOLINÆ, Hidalgo. Pl. 3, figs. 14–16.

Perviously umbilicated, rather thin, somewhat shining, striulate, brownish above, with white scattered spots, banded below, sometimes all brown, with small white spots, or corneous, with translucent brown bands and irregular maculations; whorls 5–5½, a little convex, slowly increasing, the last scarcely deflected in front, periphery obsoletely angulated; peristome acute, white, labiate within, margins approaching. Diam. 10 mill.

Columbret Is. between Spain and the Balearic Is.

H. Madritensis, Rambur. Pl. 3, figs. 17, 18.

Perforate whitish or ash colored, with two maculated brown bands above, often obsolete, thinly and regularly closely costulate; whorls 5, the last subinflated, a little deflected in front, base subturgid, suture conspicuous, periphery carinated; peristome simple, acute, widely labiate within, margins joined by a thin white callus. Diam. 9 mill.

Madrid, Spain.

H. Penchinati, Bourg. Pl. 3, figs. 19–21.

Perviously umbilicated, striate, corneous chestnut color flamed with white above, whitish, dark banded below, suture impressed; whorls 5½, a little convex, slowly increasing, the last carinated, the carina vanishing towards the aperture, suddenly descending, base convex; peristome simple, acute, slightly thickened within, margins approximating, joined by a thin callus. Diam. 6·5 mill.

Barcelona, Spain.

H. codia, Bourg. Pl. 3, figs. 22–24.

Narrowly umbilicated, subpellucid, elegantly costate, yellowish corneous with interrupted chestnut lineolations, apex corneous; whorls 6, slightly convex, regularly increasing, suture scarcely impressed, last whorl rounded, abruptly descending at the aperture; peristome acute, white margined within. Diam. 12 mill.

Portugal.

H. intersecta, Morelet is a synonym.

Ancey has indicated a var. rufa.

H. semipicta, Hidalgo. Pl. 3, fig. 2.

Moderately umbilicated, thin, subopaque, a little shining, minutely striated above, smooth below, light yellowish white, with pellucid maculations above, profusely variegated and banded at the periphery with brownish corneous, suture rather deep; whorls 5–5½, a little convex, regularly increasing, the last convex, slightly descending in front, base subdepressed; peristome acute, sublabiate within. Diam. 9·5 mill.

Alcarez, Spain.

H. Gigaxii, Charp. Pl. 3, figs. 25–27.

Arcuately rimate, solid, closely striated, opaque, whitish or flesh color, unicolored or marbled and interruptedly banded with chestnut, apex corneous; whorls 5, somewhat flattened, the last wider, not

descending in front, base convex; peristome simple, acute, remotely labiate within, margins approaching. Diam. 9·5–12·5 mill.

France, Belgium, England.

H. MEDA, Porro. Pl. 3, fig. 44.

Scarcely rimate, globose above, somewhat flattened below, costulate-striate, whitish or brownish, with narrow interrupted chestnut bands, sometimes unicolored; whorls 5, scarcely convex, the last angulated on the periphery, not descending in front, base subplane, striate; peristome acute, with flesh colored callus within.

Diam. 10–12 mill.

Sicily, Sardinia, Malta.

H. subclausa, Rossm., and *H. Calypso* and *Turatii*, Parr, are synonyms.

Unfigured Species of Subsection Candidula.

H. HYPÆANA, H. DEFERIANA, and H. DANIELI, Bourg. *France.*

H. CARCUSIANA, H. HERIPENSIS, H. THUILLIERI and H. LOROGLOSSICOLA, H. ARGA, H. ILICETORUM, H. BELLOQUADRICA, Mabille. *France.*

H. HICETORUM, Locard. = H. ILICITORUM, Mabille.

H. FLORENTINÆ, Ponsonby. *Tangiers.*

H. ANTONIANA, Rochebrune. *St. Antoine, Cape Verd Is.*

H. DUMEVAGA, Morelet. *Morocco.*

H. CITHARISTENSIS, H. REQUIENI, H. MARSIANA, H. VICIANICA, Bourg. *France.*

H. PSAROPSIS, H. IDANICA, H. GAROCELIANA, H. ELIMBERRISIANA, H. ARELATENSIS, Locard. *France.*

H. YCAUNICA, H. PHILOMIPHILA, H. LUGDUNIACA, LE MESLEI, Mabille. *France.*

H. DIENSIS, H. PSILORITANA, H. SUBVARIEGATA, H. FREYTAGI, Maltzan. *Isle of Crete.*

H. COMMEATA, and H. MESOPOTAMICA, Mousson, and Var. GHAESIANA, of the latter species. *Mesopotamia.*

H. ORDUNENSIS, Kobelt. *Orduna, Biscay, Spain.*

H. DEANA, and H. PLEURESTHA, Tassy. *France.*

H. NILSSONIANA, Beck, (*H. ericetorum*, Nilss.). *Sweden.*

H. FUREDENSIS, H. BAKONYCA, H. PLATTENICA, Servain. *Hungary.*

H. ARNUSIACA, Fagot, (*H. profuga*, Var. *Etrusca*, Issel). *N. Italy.*

H. Aprutiana, Fagot. *Abruzzi, Italy.*
H. Visanica, H. Carpensoractensis, H. Foliorum, Fagot. *France.*
H. Prinohila, H. Solaciaca, Mabille. *France.*
H. Robiniana H. Pauli, H. philora, H. ruida. Bourg. *France.*
H. Brinophila, Locard. = H. prinohila, Mabille.
H. rhytephora, Carp. *Egypt.*
H. Kotschyi, Pfr. *Persia.*
H. aurigerana, H. Alavana, H. Ussatensis, Fagot. *France.*
H. lunulata, Krynicki. *Odessa.*
H. Florentinæ, Fagot. *Florence, Italy.*
H. tringa, Fagot. (*H. profuga*, Var. *tringa*, West.) *Ins. Lido, Venice.*
H. Gradiscanensis, Fagot. *Istria.*
H. Pouzonensis, H. Renei, H. Crouziliana, H. Margieriana, H. Siticulosa, H. scrupellina, Fagot. *France.*
H. Monistrolensis, H. Jousseaumei, Fagot. *France.*
H. Iriana, Pol. *Piedmont.*
H. Honorati, H. subintersecta, H. Pictonum, H. Lirouxiana, Bourg. *France.*
H. idiophya, Florence. *France.*
H. Callistha, Berenguier. *France.*
H. vestita, Rambur. *So. France, Spain, Corsica.*
H. Strucki Maltzan. *Portugal.*
H. Romana, H. Colosseana, Fagot. *Rome.*
H. Fiesolensis, Fagot. *Fiesole, near Florence.*
H. Eumæus, Lowe. *Mogador, Morocco.*
H. Brundusiana, Fagot. *Brindisi, Italy.*
H. Lesiniaca, Fagot. *Ins. Lesina, Dalmatia.*
H. Samnitum, and Var. pugnax, Westerl. *Samnium, Italy.*
H. Andalusica, Kobelt. *Spain, Portugal.*
H. herbarum, H. Xenelica, Servain. *France.*
H. Gesocribatensis, H. Scrupæa, H. Lieuranensis, H. Groboni, H. Coutagnei, H. nomephila, H. Tolosana, H. Veranyi, H. Valcourtiana, H. Mauriniana, H. acentromphala, H. Jeanbernati, H. acosmia, H. Frayssiana, H. Moqueroni, H. erema, H. microphana, H. Tarasconensis, H. ruida, Bourg. *France.*

H. Lauraguaisiana, Locard. *France.*

H. eucalla, H. Isæa, H. irana, Hagenmuller. *Tunis.*

H. amicula, H. amphibola, H. anasia, H. goniogyra, H. Saharica, H. ischurostoma, H. terricola, H. galeomma, H. bryaræa, H. aggarica, H. Malaspinæ, H. Duveyrieriana, H. agrioica, H. specialis, H. Mauritanica, H. taria, H. Krizensis, Bourg. *Tunis.*

H. tremata, H. incolumis, H. Lecouffei, H. istera, H. Mehediana, H. crisia, H. bradybæna, H. æglia, H. argoderma, H. eucoræa, H. ambloxa, H. concholeuca, Letourn. et Bourg. *Tunis.*

H. messapia, Blanc. *Tunis.*

H. herbatica, Fagot. *Tunis.*

H. mendranoi, H. Canovasiana, H. Solanoi, H. alluvionum, Servain. *Tnnis.*

Besides the above, which are mostly species as understood by the "new school" conchologists—that is merely local variations, an additional large number of names are quoted in Letourneux and Bourguignats "Prodr. Mal. Tunisie" as European relations of Tunisian forms. These are mostly undescribed, and therefore need not be reproduced here.

Subsection VI, Lemniscia, Lowe. 1854.

H. tumulorum, Webb and Berthelot. Pl. 3, figs. 28, 29.

Subcovered perforate, closely, distinctly striate, white with interrupted brown bands; whorls 6–7, scarcely convex, the last not descending, periphery sharply angulated, base flatly convex; peristome simple, acute. Diam. 12 mill.

Canary Is.

H. phalerata, Webb and Berthelot. Pl. 3, figs. 31–33.

Perforate, distinctly costulate-striate, whitish or yellowish white, with an interrupted band and a series of maculations of chestnut above; whorls 6, a little convex, the last obsoletely subangulated, not descending in front; peristome acute, sublabiate within.

Diam. 8·5 mill.

Canary Is.

It is *H. Roseti*, Webb and Berth. not Mich., and *H. Nivariensis*, Shuttl.

H. persimilis, Shuttl. Pl. 33, fig. 70.

Subcovered perforate, thin, plicately striate, corneous, with two interrupted chestnut bands, maculated with white, one above, the

other below the periphery; whorls 6, slightly convex, the last not descending in front, periphery obtusely angulated; peristome simple, acute. Diam. 7 mill.

Ins. Teneriffe and Palma.

H. præposita, Mousson is a synonym.

Var. DEVIA, Mousson.

Somewhat larger, depressed conical, subcarinate, marbled with grey and corneous above, with two bands of brown and white spots.

H. OLEACEA, Shuttl. Pl. 4, figs. 34–36.

Subcovered perforate, thin, fragile, a little shining, striate, yellowish brown, with a series of chestnut maculations near the suture and another on the middle of the base; whorls 5–5½, scarcely convex above, the last not descending, with a peripheral carina vanishing in front; peristome simple, acute. Diam. 8 mill.

Ins. Palma, Canaries.

H. deusta, Lowe is a synonym.

H. WOOWARDII, Tarnier. Pl. 4, figs. 37–39.

Narrowly umbilicated, thin, fragile, dull, lightly plicately striate, uniform whitish- or yellowish-corneous, without bands, the plicæ a little paler; whorls 5, slightly convex, the last scarcely descending in front, periphery angulated, the keel visible some distance up the spire, base a little more convex; peristome acute, scarcely expanded, not labiate. Diam. 7 mill.

Ins. Teneriffe.

H. CÆMENTITIA, Shuttl. Pl. 4, figs. 40–42.

Narrowly umbilicated, solid, dull, plicately costulate, ash colored, marbled with corneous, with a single peripheral interrupted band of chestnut and white spots; whorls 6, slowly increasing, scarcely convex, the last shortly deflected in front, periphery carinated, carina vanishing towards the aperture; aperture banded with chestnut, peristome acute, thickened within, the margins joined by a white callus. Diam. 11·5 mill.

Canary Is.

H. MONILIFERA, Webb and Berthelot. Pl. 4, figs. 43, 44.

Subcovered perforate, somewhat solid, strongly striate, whitish with one superior and two inferior bands of chestnut maculations; whorls 5–5½, slightly convex, the last scarcely descending, periphery

rounded; peristome acute, strongly labiate within, margins distant, with a slight connecting callus. Diam. 6·7 mill.

Canary Is.

It is *H. Lancerottensis* of Orb. Moll. Canaries, text but not figures.

H. MICHAUDI, Desh. Pl. 4, figs. 45, 46.

Subcovered perforate, rugosely striate, shining, brownish white, with three continuous chestnut bands; whorls 7, slightly convex, the last not descending, periphery rounded, base scarcely more convex than above; peristome acute, labiate within. Diam. 10–12 mill.

Porto Sancto, Madeiran Is.

H. bicolor, Lowe is synonym.

H. LEMNISCATA, Webb and Berthelot. Pl. 4, figs. 47–49.

Covered perforate, obliquely distinctly striate, brownish white or yellowish, banded with chestnut or chocolate, bands sometimes interrupted; whorls 6, slightly convex, the last not descending in front, periphery obtusely angulated, base flattened convex, peristome acute, slightly chestnut-lipped within. Diam. 9 mill.

Grand Canary Isl.

H. ATOMATA, Menke. Pl. 4, figs. 50–52.

Evidently a young shell,—possibly of *H. tumulorum*, Webb and Berth.

Hab. unknown.

Unfigured Species.

H. UMBICULA, Shuttl. *Canary Is.*

H. Rosetti, and *H. phalerata* of Pfr. (not Webb and Berth.), are synonyms.

H. WATSONIANA, Wollaston. *Grand Canary, and Teneriffe Is.*

Subsection VII, XEROLEUCA, Kobelt. 1877.

H. TUNETANA, Pfr. Pl. 4, figs. 53, 54.

Moderately umbilicated, solid, opaque, roughly granular, yellowish brown, whorls 4, plane above, exserted and compressly carinated, the last not descending, base somewhat convex, angulated round the umbilicus; peristome subsimple, the base thickened and reflected. Diam. 18 mill.

Tunis.

H. TETRAGONA, Morelet. Pl. 4, figs. 55–57.

Widely umbilicated, rather thin, striated, greyish; whorls 4½, flattened above, suture margined, periphery acutely carinated, base

compressly inflated, with a thread-like carina round the perspective umbilicus; peristome simple, acute. Diam. 15 mill.

Algeria.

H. TURCICA, Chemn. Pl. 4, figs. 58–60.

Widely umbilicated, rugosely, vermicularly striated, crenulately carinated, greyish white; whorls 5½, rapidly increasing, with sub-crenulated suture, umbilicus perspective, bounded by a crenulated carina. Diam. 24 mill.

Morocco.

It is *H. cratera*, Schum.

H. MOGADORENSIS, Bourg. Pl. 4, figs. 61–63.

Widely umbilicated, solid, cretaceous, opaque, yellowish white, vermicularly striate; whorls five, all slightly carinate, peripheral carina compressed, crenulated, last whorl a little descending in front, umbilicus bordered by a thread-like carina.

Diam. 17 mill.

Mogador, Morocco.

H. MOGRABINA, Morelet. Pl. 4, fig. 64.

Moderately umbilicated, vermicularly striate, cretaceous, solid, grayish white; whorls 6, slowly increasing, crenulately carinated at the suture, peripheral carina compressed, tubercularly crenulated, base turgid, the umbilical region defined by an angle.

Diam. 17 mill.

Morocco, Algeria.

H. DEGENERANS, Mousson. Pl. 4, figs. 65, 66.

Widely umbilicated, cretaceous, vermicularly striated; whorls 5½, slightly convex above, crenulately carinated, umbilicus with a thread-like carina; peristome acute.

Diam. 16 mill.

Morocco.

H. CONOPSIS, Morelet. Pl. 4, figs. 67, 68; Pl. 5, figs. 11–13.

Moderately umbilicated, granularly rugose, particularly below, grayish white, cretaceous; whorls 6, scarcely convex, periphery with a thread-like carina, base convex, umbilical region angulated.

Diam 12 mill.

Morocco.

Unfigured Species of Xeroleuca.

H. DAROLI, Letourn. *Algeria.*

H. DJARICA, Bourg. *Algeria.*

H. Libyca, Ponsonby. *Libya, N. Africa.*
H. Berenice, Kobelt. *Libya, N. Africa.*

Subsection VIII, Turricula, Beck. 1837.

H. derogata, Rossm. Pl. 4, figs. 73–76.

Moderately umbilicated, somewhat solid, minutely striate, shining, whitish, with narrow chestnut bands above and below the periphery, and narrow ones on the base; whorls nearly 5½, scarcely convex, the last depressed, rounded, not descending in front, base more convex; peristome acute, white-lipped within. Diam. 9 mill.

Murcia, Spain.

H. subrogata, var. *β.* is a synonym.

Var. angulata, Rossm. Fig. 76.

Usually maculosely variegated above, costulations stronger, periphery angulated.

H. Murcica, Guirao is a synonym.

H. Hipponensis, Morelet. Pl. 4, fig. 77.

Narrowly perforate, thin, costulate-striate, whitish, with continuous or interrupted chestnut bands; whorls 6½, convex, the last angulated at the periphery, not descending in front; peristome acute, slightly margined within. Diam. 10 mill.

Algeria.

H. Warnieriana, Bourg. Pl. 4, figs. 78–80.

Perforate, moderately solid, chalky, somewhat pellucid, malleated by obscure striæ, yellowish white, irregularly variegated with subtranslucid corneous maculations; whorls 6½, scarcely convex, the last slightly descending in front, periphery obtusely angulated, angle evanescent towards the aperture; peristome acute, remotely white-lipped within. Diam. 10 mill.

Tunis.

H. pyramidata, Drap. Pl. 5, fig. 83–86, 99, 100, 3; Pl. 4, figs. 81, 82.

Narrowly umbilicated, striulate, white, unicolored or banded and variegated with chestnut, spire obtuse; whorls 6, convex, the last not descending in front, a little flattened on the base; peristome acute, labiate within. Diam. 11 mill.

Mediterranean Region.

H. agnata, H. arenaria, H. littoralis, H. sabulosa, and *H. spectabilis*, Zglr., are synonyms.

Var. NOVA, Paulucci. Figs. 86–88.

Shell much more depressed, periphery sometimes obsoletely angulated, unicolored or variegated.

Calabria.

Var. GRATIOSA, Paulucci. Undescribed.

Var. DEPRESSA, Bourg. Fig. 3.

More depressed than the type, but not so flat as the Var. *nova*, scarcely obsoletely angulated, umbilicus somewhat larger.

Calabria, Algiers.

Var. NUMIDICA, Moquin-Tandon. Pl. 4, figs. 81, 82.

Depressed conical, last whorl with angulated periphery, convex on the base, umbilicus wider than the type.

Algiers.

Var. TARENTINA, Pfr. Figs. 99, 100.

Very narrowly umbilicated, closely costulate, light brownish, sometimes variegated and subfasciate with whitish and brownish; whorls 6, the last subangulated, not descending, base subplanate; peristome remotely labiate. Diam. 10 mill.

Naples.

H. THIESSEÆ, Mousson. Pl. 5, figs. 89–92.

Narrowly umbilicated, rather solid, striate, whitish, often variously banded and maculated with chestnut; whorls 5½, slightly convex, slowly increasing, with impressed suture, last whorl a little descending in front, the periphery subangulated; peristome simple, scarcely expanded, strongly, remotely labiate within.

Diam. 10 mill.

Eubœa, Greece.

H. CHALCIDICA, Blanc. Pl. 5, figs. 93–95.

Narrowly umbilicated, striate, whitish, unicolored, or with a superior and a basal band of chestnut maculations; whorls 5½, moderately convex, with well impressed suture, last whorl descending in front, base convex; peristome acute, strongly labiate within.

Diam. 13 mill.

Greece.

H. DAVIDIANA, Bourg. Pl. 5, figs. 4–6.

Narrowly umbilicated, solid, chalky, not shining, whitish, submaculated above, subzonate below, strongly, irregularly costate; whorls 5½, convex, regularly increasing, subcarinated, the periphery obtusely angulated, the last whorl descending in front; peristome simple, slightly thickened within. Diam. 9 mill.

Jerusalem.

H. SERRULATA, Beck. Pl. 5, figs. 1, 2.

Very narrowly perforate, corrugately tuberculate-striate, whitish more or less banded with chestnut, especially on the base; whorls 6, slightly convex, subcarinate, the last with angulated, tuberculated peripheral angle; peristome acute, internally labiate.

Diam. 12 mill.

Egypt.

H. crenulata, Olivier, is a synonym.

H. PTYCHODIA, Bourg. Pl. 5, figs. 7, 8.

Narrowly umbilicated, rather thin, subtuberculate above and crispately ribbed, yellowish white; whorls 6, scarcely convex, slightly carinate at the suture, the last whorl with angulated periphery, the angle evanescent near the aperture, base convex, less strongly striate; peristome acute, slightly thickened within.

Diam. 15 mill.

Egypt.

Is possibly a synonym or a variety of the preceding species.

H. PHILAMMIA, Bourg. Pl. 5, figs. 9, 10.

Narrowly perforate, opaque, chalky, rugosely, subtubercularly costate above, less roughly so below, whitish, faintly banded on the base; whorls 6½, tubercularly carinated at the suture and on the periphery, last whorl suddenly deflected in front, base convex; peristome acute, thickened within. Diam. 13 mill.

Egypt, Syria.

One of a series of species whose differences may be only varietal.

H. TUBERCULOSA, Conrad. Pl. 5, figs. 16, 17.

Narrowly perforate, opaque, cretaceous, corrugately striated, and tubercularly bicarinated, irregularly rugose below, yellowish white; whorls 6, flattened, periphery strongly tubercularly carinated, base a little convex; peristome acute, slightly labiate within.

Diam. 12–13 mill.

Palestine.

H. Despreauxii, Bourg., is a synonym.

H. DESPREAUXII, d'Orb. Pl. 5, figs. 18, 19.

Perforate, rugosely tuberculate, calcareous, whitish, carinate; whorls 5, somewhat exserted, tubercularly bicarinated, the lower carina more prominent; aperture brownish, peristome simple, acute, margins approaching, connected by a callus. Diam. 8 mill.

Canary Is.

H. Preauxii, Hartm., is a synonym.

Var. IMMODICA, Mousson.

Thicker, more elevated, nodules less numerous but stronger; peristome obtuse, thickened, continuous, subsolute.

Grand Canary Isl. (subfossil).

H. MODERATA, Mousson. Pl. 5, figs. 20, 21.

Minutely, varying to rather narrowly umbilicated, nodulously rugose and bicarinated, greyish white, suture serrately margined above; whorls 5, subexserted, the last strongly carinated on the periphery, descending at the aperture, base slightly convex, radiately nodulous; peristome acute, sublabiate, margins converging but not continuous. Diam. 10 mill.

Is. Fuerteventura and Lanzarote, Canaries.

Described as a variety of *H. Despreauxii*, which it very probably is, although both Pfeiffer and Wollaston consider it distinct.

H. MIRANDÆ, Lowe. Pl. 5, figs. 22–25.

Narrowly umbilicated, rugose, with distant oblique corrugated ribs, smoother on the base, more regularly plicate, whitish, with an interrupted basal chestnut band; whorls 5, obsoletely bicarinated, periphery of last whorl crenulately carinated, the suture crenulated; peristome simple, acute. Diam. 7 mill.

Ins. Gomera, Canaries.

H. nodoso-striata, Mousson (figs. 24, 25), is apparently a not fully grown specimen of this species.

H. HESPERIDUM, Morelet. Pl. 5, figs. 14, 15; Pl. 6, figs. 53, 54.

Very narrowly perforate, slightly shining, greyish, the rugosities lighter colored, base unifasciate, obliquely rugose, somewhat tuberculate; whorls 6, carinate, peripheral carina tuberculate; aperture brownish, peristome thin, simple. Diam. 8·5 mill.

Near Mogador, Morocco.

H. INOPS, Mousson. Pl. 5, figs. 26, 27.

Minutely perforate, arcuately subcostulate-striate, slightly shining, white, suture impressed, simple; whorls 5½, a little convex, the last not descending, periphery obtusely carinated; peristome acute, margins not approaching. Diam. 8 mill.

Grand Canary Isl.

H. CYCLODON, Webb and Berthelot. Pl. 6, figs. 34, 35.

Scarcely perforate, rugosely striated, brownish white, suture dentate; whorls 7, flattened, dentately carinated, with a series of tu-

bercles above the peripheral carina, base slightly convex; peristome simple, acute. Diam. 7·5 mill.

Canary Is.

Has been referred, as a synonym, to the next species, but its differential characters are obvious.

H. PUMILIO, Chemn. Pl. 6, figs. 49, 50.

Narrowly umbilicated, whitish, muricately rugose; whorls 7, all acutely carinated, last whorl bicarinated, the peripheral carina serrated, base rugosely striate. Diam. 10 mill.

Near Mogador, Morocco.

H. TROCHOIDES, Poiret. Pl. 5, figs. 28–31; Pl. 6, figs. 36–39.

Perforate, substriate, whitish, unicolored or chestnut banded; whorls 5–6, slightly convex, with thread-like carina, base a little convex; peristome acute, labiate within. Diam. 6·67 mill.

Mediterranean Countries.

It is *H. conica*, Drap., *H. Algira*, Chier., *H. solarium*, Risso.

Var. SULCULATA, Jan. Figs. 30, 31.

Carina obsolete, costulate-striate, usually maculated with chestnut, whorls scarcely convex.

Sicily, Malta, Italy, etc.

H. rugosiuscula, Mich., and *H. rugosa*, Arad., are synonyms.

Var. PUMILIO, Pfr.

Umbilicus wider, costulate-striate, carina crenulated.

Var. PYRAMIDELLA, Jan.

Trochiform, umbilicated, striate, obtusely carinated, white, with diaphanous corneous maculations.

Northern Italy.

Var. TURRITELLA, Parr. Figs. 36, 37.

Perforate, striatè, with a brown band above the carina and usually another on the base, suture distinctly thread-margined; whorls 6½, convex, the last with subacute thread-like carina.

Dalmatia.

Var. REMISSA, Parr.

Shell smaller, whorls 6, with oblong maculations and brown striæ above. Diam. 4 mill.

Ins. Lesina.

Var. VERTICILLATA, Parr. Figs. 38, 39.

Perforate, conical, closely plicate, white, suture margined; whorls 6, slightly convex, peripheral carina defined by a sulcus.

Diam. 5 mill.

Ins. Rhodes; Italy.

Var. VIDUA, Westerl.

Whorls 7, all rounded, without carina, suture very deep.

Diam. 8 mill.

Spezzia.

A single specimen, perhaps a monstrosity.

H. SYRENSIS, Pfr. Pl. 5, figs. 32, 33.

Narrowly umbilicated, closely costulate, whitish marbled with brown; whorls 5, exserted, carinated, flattened, base slightly convex; peristome acute, white-lipped within. Diam. 8 mill.

Ins. Syra.

H. SCHOMBRII, Scacchi. Pl. 6, figs. 40–42.

Deeply umbilicated, obliquely costulate-striate, whitish, sometimes chestnut banded; whorls 6, slightly convex, with thread-like, crenulated carina, suture somewhat margined, base convex; peristome acute, remotely labiate within. Diam. 8 mill.

Malta.

H. calcarata, Benoit, is a synonym.

H. CUCULLUS, Mart. Pl. 6, figs. 43–45.

Moderately umbilicated, plicately striate, greyish white, with subsutural maculations and obsoletely banded with chestnut, suture moderately impressed; whorls 6, slightly convex, the last rounded, scarcely descending in front, base flatly convex; peristome acute, white-lipped within. Diam. 10 mill.

Malta.

H. IDALIÆ, Bourg. Pl. 6, figs. 46, 47.

Narrowly perforate, somewhat solid, whitish or light greyish, irregularly serrulately costulate; whorls 6, very convex, obsoletely subangulated, with deep suture, last whorl scarcely descending in front; peristome simple, acute, labiate within at the base.

Alt. 7, diam. 5 mill.

Ins. Cyprus.

H. LIEBETRUTI, Albers. Pl. 6, fig. 48.

Perforate, somewhat solid, subarcuately costate, opaque, cretaceous, whitish, suture deep; whorls 5½, very convex, scalariformly exserted, the last not descending, crenately carinated below the middle, with a slight sulcus above the carina, base flatly convex; peristome acute, brown-lipped within. Diam. 5·3 mill.; alt. 6 mill.

Ins. Cyprus.

H. Newka, Dohrn. Pl. 6, figs. 51, 52.

Perforate, very closely costulate, yellowish grey, maculated and zoned with chestnut, suture distinct; whorls 6½–7, bicarinated, carinæ obtuse, divided by a sulcus, base convex; peristome acute above, slightly reflected below. Alt. 11, diam. 9·5 mill.

Balearic Is.

H. apiculus, Rossm. Pl. 6, figs. 55, 56.

Narrowly perforate, closely costulate-striate, white, marbled and flamed with brown; whorls 6, carinated, flattened, carina minutely serrulate, base subplane, striate; peristome acute, labiate within. Diam. 9 mill.

Ins. Lampedusa, Calabria.

H. Cumiæ, Calcara, is a synonym.

H. terrestris, Pennant. Pl. 6, figs. 57–62.

Very narrowly umbilicated, solid, opaque, white or corneous brown, sometimes unifasciate or maculated, strongly obliquely costulate; whorls 6–7, flattened, all crenulately carinated, base flatly convex; peristome acute, white-lipped within. Diam. 9–13 mill.

Mediterranean Region.

It is *H. elegans*, Gmel., *H. crenulata*, Mull?, *H. trochulus*, Hartm.

Var. scitula, Jan. Figs. 60–62.

More depressed, greyish brown, without bands.

H. trochilus, Poir., *H. depressa*, Beck, and var. *perdepressa*, West, are synonyms.

There are also varieties *canaliculata*, Rigacci, *ferruginea*, Rigacci, and *cornea*, Dupuy.

H. elata, Faure-Biguet. Pl. 6, figs. 63–66.

Narrowly perforate, obliquely closely costulate, whitish; whorls 9, flattened, exserted, crenulately carinated, base flattened convex; peristome acute, sublabiate within. Diam. 7, alt. 9 mill.

Sicily, Capri.

Var. dilatata, Benoit. Figs. 65, 66.

More depressed, concavely conical, base dilated.

Diam. 9–10·5 mill., alt. 7–9 mill.

H. Caroni, Desh. Pl. 6, figs. 67, 68.

Narrowly perforate, obliquely closely plicate, yellowish, maculated with chestnut; whorls 10–11, flat, exserted, serrately cari-

nated, the last not descending in front, base flattened; peristome acute, remotely labiate within. Diam. 8, alt. 11 mill.

Sicily.

It is *H. turrita*, Rossm., *H. pyramis*, Phil., and *H. elata*, Cantraine.

H. SEQUENTINA, Benoit. Pl. 6, figs. 69, 70.

Narrowly perforate, costulate, whitish; whorls 9–10, carinated, not exserted, flat, the last not descending in front; peristome acute, remotely labiate within, basal margin slightly reflected.

Diam. 7, alt. 8·5 mill.

Sicily.

H. TROCHLEA, Pfr. Pl. 6, figs. 71, 72.

Perforate, obliquely costulate-striate, whitish, sometimes maculated with chestnut, or banded on the base; whorls 8, exserted, acutely crenulately carinated, flattened, base a little convex, more closely and finely striated; peristome acute, slightly labiate within.

Diam. 7·67, alt. 8 mill.

Algeria.

Unfigured Species of Turricula.

H. EUGONIOSTOMA, H. CHTHAMALOLENA, H. SYROSINA, Bourg. *Ins. Syra.*

H. SIMIARUM, Kobelt. *Gibraltar.*

H. LICODIENSIS, Cafici. *Sicily.*

H. SULLIOTTII, Pollonera. *Piedmont.*

H. BERTINI, Bourg. *France.*

H. ARCENTOPHILA, Mabille. *France.*

H. MELOLONTHA, Shuttlew. *Canary Is.*

H. KELIBIANA, H. NEWKOPSIS, H. EUPYRAMIS, H. ZITOUMICA, H. MADANA, H. GALACTINA, H. VENERIANA, H. SPAELLA, H. SPAELLINA, Letourn. and Bourg. *Tunis.*

H. TISEMSINICA, H. CAPUANA, H. DYRRACHIENSIS, H. ANOMBRA, H. MACTANICA, Bourg. *Tunis.*

The two following Chinese species appear to be at least equally related to Bulimus, as suggested by Ancey (Bull. Soc. Mal. Fr. 113, 1885).

H. BULIMINOIDES, Heude. Vol. III, Pl. 52, figs. 18, 19.

Covered perforate, obsoletely striulate, shining, brownish white; whorls 7–9, slightly convex, slowly and regularly enlarging, suture superficial, last whorl obtusely carinated, not descending in front, convex below; peristome a little thickened and reflected.

Length, 10–13 mill.

Nanking, China.

H. PSEUDOBULIMINUS, Heude. Vol. III, Pl. 52, figs. 16, 17.

Perforate, strongly spirally striate, greyish white, shining; whorls 9, convex, suture margined, last whorl angulated and channeled below the angle, base convex; peristome acute, slightly expanded.

Length, 12 mill.

China.

Subsection IX. COCHLICELLA, Risso. 1826.

H. CONTERMINA, Shuttl. Pl. 6, figs. 73, 74.

Perforate, rather thin, closely costulate-striate, light grey, fasciate or punctate with chestnut; whorls 7, slightly convex, the last rounded; peristome acute, labiate within.

Diam. 8, alt. 9 mill.

Corsica.

H. psammoica, Morelet, is a synonym.

H. DUPLICATA, Mousson. Pl. 6, figs. 75, 76.

Perforate, somewhat solid, calcareous, strongly obliquely striate, slightly shining, white; whorls 6, slightly convex, the last rounded, the base convex, with a central filiform spiral ridge, on the two sides of which the striæ are differently directed; peristome acute, not labiate within, subincised below. Diam. 8·2 mill.

Mogador, Morocco.

H. VATONIANA, Bourg. Pl. 6, figs. 81, 82.

Narrowly perforate, rather thin, chalky, whitish, with subopaque, variously disposed flames, strongly, closely costulate-striate; whorls 5½, convex, slowly increasing, scarcely descending in front; peristome acute, labiate within. Diam. 8 mill.

Algeria.

H. CONOIDEA, Drap. Pl. 6, figs. 77, 78.

Perforate, striulate, a little shining, white, variously banded with chestnut; whorls 6, somewhat convex, the upper ones carinated; peristome acute, simple, margins converging.

Diam. 6·5, alt. 9·5 mill.

Mediterranean Region.

It is *H. fibula*, Wood, *H. turbida*, Küster, and *H. solitaria*, Pfr., but not of Poiret—the latter being a scalariform monstrosity of *H. candidula*, according to Moquin-Tandon.

H. Pringi, Pfr. Pl. 6, figs. 79, 80.

Narrowly umbilicated, solid, irregularly striate and punctate, whitish, cretaceous, usually with a basal chestnut band, sometimes marbled with corneous; whorls 7, somewhat convex, periphery obsoletely angulated; peristome simple, margins approaching.

Alt. 8, diam. 5 mill.

Portugal.

H. ventricosa, Drap. Pl. 6, figs. 83–85.

Very narrowly perforate, plicately striate, variously strigate and banded with corneous or chestnut; whorls 7, somewhat flattened; peristome acute. Alt. 9, diam. 5·5 mill.

Mediterranean Region, Canaries, Azores, Bermuda (introd.).

It is *H. ventrosa*, Fer., *H. acuta*, Webb, *H. bulimoides*, Moquin-Tandon, *H. carinula*, Gmel?, *H. cretacea*, Chemn., *H. agnata*, Ziegler, *H. barbara*, Linn., teste Bourg.

H. acuta, Müller. Pl. 6, figs. 86–88.

Very minutely perforate, irregularly striate, whitish, variously banded and strigate with chestnut; whorls 9–10, at first carinated, subsequent ones rounded; peristome acute, simple.

Alt. 15, diam. 5·5 mill.

Mediterranean Region, Great Britain, etc.

The synonyms are *H. barbara*, Linn., teste Westerl., *H. fasciata*, Pennant, *H. bifasciata*, Pultney, *H. meridionalis*, Risso, *H. ventricosa*, Turton, *H. litoralis*, Brum., *H. articulata*, Lam., *H. acutula*, Ziegl., var. *maritima*, Desm., *H. turritella*, Andrz., *H. variabilis*, Hartm., *H. Maroccana*, Beck.

H. Bellucciana, Bourg. Unfigured. *Tunis.*

H. buliminus, Heude. Vol. III, Pl. 52, fig. 20.

Rimately perforate, irregularly striated, chestnut color; whorls 8, slightly convex, with impressed suture, slowly increasing, the last rounded; peristome simple, callous within. Length, 16 mill.

Setchouan, China.

This and the following would be at least equally well placed in Bulimus.

H. TAIVANICA, Möll. Vol. III, Pl. 52, fig. 21.

Subperforate, thin, minutely, obliquely, rugulosely striate, a little shining, fulvous; whorls 10, slightly convex, the last rounded; peristome simple. Length, 10 mill.

China.

Bul. incertus, Pfr., is a synonym.

Section III. OCHTHEPHILA, Beck. 1837.

Subsection I. OCHTHEPHILA (sensu stricto).

H. ECHINULATA, Lowe. Pl. 7, fig. 89.

Perforate, granular scaly, brownish, with two chestnut bands on the base; whorls 6, flatly convex, the last acutely carinate, descending in front, base somewhat flattened, concave next the carina; peristome acute, continuous, slightly expanded. Diam. 5·6 mill.

Porto Sancto, Madeira.

It is *H. bicarinata*, var. of Paiva.

H. BICARINATA, Sowb. Pl. 7, fig. 90.

Perforate, roughly granulated, brownish; whorls 5, bicarinate, the last suddenly deflected in front, base scarcely convex; peristome acute, slightly expanded, circular, continuous.

Diam. 5·3 mill.

Porto Sancto, Madeira.

H. duplicata, Lowe, is a synonym.

H. TURRICULA, Lowe. Pl. 7, fig. 91.

Scarcely perforate, minutely, closely granulated, brownish, unicolored or obsoletely banded below; whorls 8–8½, bicarinate, the carinæ subequal, divided by a sulcus, suture distinct, last whorl scarcely deflected in front, base a little convex; peristome continuous, scarcely solute, thin, acute, shortly reflected at the base.

Alt. 9, diam. 7 mill.

Ilheo de Cima, near Porto Sancto, Madeira.

H. OXYTROPIS, Lowe. Pl. 7, fig. 92.

Narrowly perforate, roughly granular, chestnut color, with yellowish base, suture linear; whorls 6, flattened, the last acutely angulated, deflected in front, base scarcely convex, sulcate next the periphery; peristome continuous, solute, simple, subexpanded.

Diam. 9 mill.

Porto Sancto, Madeira.

H. ECHINODERMA and H. LEACOCKIANA, Wollaston. Unfigured. *Pto. Sancto.*

H. ALBERTISII, Brazier. Unfigured. *New Guinea.*

Subsection II. GEOMITRA, Swains. 1840.

H. CORONATA, Desh. Pl. 7, fig. 93.

Moderately umbilicated, solid, fulvous white, suture deep, margined; whorls 5, angulated above, obliquely ribbed above, last whorl carinated, suddenly deflected and narrowed in front, base convex, undulately costulate; aperture subhorizontal, nearly triangular, peristome solute, continuous, a little expanded, right margin with an acute internal tooth. Diam. 6·5 mill.

Ins. Madeira.

H. juliformis, Lowe, is a synonym.

H. DELPHINULOIDES, Lowe. Pl. 7, figs. 94–96.

Widely umbilicated, solid, minutely foveately rugose, opaque, greyish, suture deep, margined; whorls 6, subangular, strongly plicately subclathrate towards the suture, with several distant spiral liræ above, the last whorl deeply deflected in front, subsolute; aperture nearly horizontal, rounded, with simple, expanded peristome.

Diam. 17·5 mill.

Madeira.

H. CORONULA, Lowe. Pl. 7, figs. 97–99.

Moderately umbilicated, dirty white or brownish, spire coronate, suture impressed; whorls 5–5½, carinate, radiately tuberculate and foveolate above, the last sub-bicarinate on the periphery, deflected in front, base regularly decussated; aperture rounded, constricted, crenulated, peristome continuous, subsinuately expanded.

Diam. 7 mill.

Ins. Deserta major, near Madeira.

H. MONIZIANA, Paiva. Pl. 7, figs. 100–2.

Moderately umbilicated, somewhat solid, obsoletely radiately tuberculately plicate, greyish white, suture margined; whorls 5, scarcely angular, with two spiral threads, limiting the radiating plicæ, periphery acutely carinated, last whorl shortly deflected, constricted and solute at the aperture, base granularly lirate; aperture diagonal, scarcely crenulated within, peristome continuous, simple, scarcely expanded, white. Diam. 7 mill.

Madeira.

It is *H. coronula*, Lowe, in part (recent).

H. TIARELLA, Webb and Berthelot. Pl. 7, fig. 3.

Very narrowly umbilicated, variegated with white and chestnut, bicarinate, tubercularly plicate at the suture, apex corneous; whorls 6½, the last anteriorly deflected, base closely, concentrically granularly sulcate; aperture subhorizontal, circular, peristome expanded, continuous, solute. Diam. 7 mill.

Madeira.

H. GRABHAMI, Wollaston. Unfigured. *Ins. Deserta Grande.*

Subsection III. HETEROSTOMA, Hartmann. 1844.

H. LATENS, Lowe. Pl. 7, fig. 4.

Narrowly umbilicated, very thin, rugulose and velvety, olivaceous corneous under a blackish integument, suture impressed; whorls 3, flattened, rapidly increasing, the last not deflected in front, periphery ciliately carinated, base convex; peristome simple, margins approximating. Diam. 7 mill.

Madeira.

Wollaston asserts that this species is never pilose; yet Pfeiffer so describes it.

H. OBTECTA, Lowe. Pl. 7, fig. 19.

Moderately umbilicated, somewhat solid, eroded scrobiculate, subgranular, dirty white; whorls 5, convex, the first immersed, the others turgid, the last angulated above, deflected in front; aperture subcircular, peristome continuous, scarcely expanded, subthickened within. Diam. 10 mill.

Is. Porto Sancto, and *Ilheo de Baxo, Madeira.*

H. PAUPERCULA, Lowe. Pl. 7, fig. 5.

Widely umbilicated, very minutely granulated, greyish, with brown dots, flattened above, convex below; whorls 3½–4, the last angulated above, angularly constricted at the aperture; peristome sub-duplicate, brownish, usually toothed within the right margin. Diam. 5 mill.

Madeira, Porto Sancto.

H. semitecta, Hartm., and *H. trachelodes*, Menke, are synonyms.

Subsection IV. IRUS, Lowe. 1854.

H. SQUALIDA, Lowe. Pl. 7, fig. 10.

Narrowly umbilicated, solid, rugulosely substriate, opaque, dirty white, suture moderate; whorls 5, flatly convex, the last shortly

descending in front, base convex, periphery obtusely angular; peristome a little expanded, subreflected at the base, thickened within, margins approaching. Diam. 7 mill.

Madeira.

H. DEPAUPERATA, Lowe. Pl. 7, fig. 6.

Narrowly umbilicated, rather solid, rugose, very minutely granular, yellowish white; whorls 5, convex, the last rounded, deflected in front, turgid around the umbilicus; peristome continuous, not solute, labiate within. Diam. 7·75–9·25 mill.

Ins. Porto Sancto.

H. LATINEA, Paiva. Pl. 7, figs. 7–9.

Moderately umbilicated, somewhat thick, dirty white, closely rugosely striate, obsoletely granular, suture impressed; whorls 5½, convex, the last rounded-inflated, deflected in front; peristome continuous, not solute, callous within. Diam. 10 mill.

Porto Sancto (subfossil).

H. LACINIOSA, Lowe. Pl. 7, figs. 11–13.

Narrowly umbilicated, rudely striated, membranously, triangularly scaly, chestnut color, variegated with whitish; whorls 5, turgid, the last deflected in front, base somewhat convex, whitish, fasciated with chestnut; aperture diagonal, peristome subsimple, continuous, basal margin reflected. Diam. 10 mill.

Is. Deserta Borealis, and *Deserta Grande, Madeiran Archipelago.*

H. EUTROPIS, Shuttlew. Pl. 7, figs. 16–18.

Rather narrowly umbilicated, solid, obliquely costulate, greyish green, suture crenulate, widely carinately margined; whorls 5½, scarcely convex above, periphery with an acute thread-like carina, base inflated, peristome a little expanded, scarcely callous, margins approximating. Diam. 14 mill.

Ins. Fuerteventura, Canaries.

H. MULTIGRANOSA, Mousson. Pl. 7, figs. 14, 15.

Narrowly umbilicated, granularly striate, whitish corneous, unicolored; whorls 5, slightly convex, subcarinate, the last obtusely angulated, a little descending in front; aperture white, peristome somewhat obtuse, subexpanded, thin-lipped within, the extremities joined by a thick callus. Diam. 14 mill.

Ins. Gomera, Canaries (subfossil?).

H. IRUS, Lowe. (Unfigured). *Mogador, Morocco.*

Subsection V. Placentula, Lowe. 1854.

H. compar, Lowe. Pl. 7, fig. 20.

Rather narrowly umbilicated, solid, strongly, arcuately costate with white, with an obsolete band above, and a more distinct band on the base, suture deep; whorls 6–6½, convexly flattened, the last deflected and shortly solute in front, periphery carinated, base more convex; peristome white, continuous, a little expanded.

Diam. 8 mill.

Madeira, and Deserta Australis.

H. tæniata, Webb and Berthelot. Pl. 7, figs. 21–23.

Widely umbilicated, striate, ashy, with a superior chestnut band; whorls 7, margined above the suture, periphery carinated; peristome free, a little thickened. Diam. 8 mill.

Madeira.

Not Canarian, as given by Webb and Berthelot, Pfeiffer, etc.

H. Maderensis, Wood. Pl. 8, fig. 24.

Moderately umbilicated, somewhat solid, whitish corneous, base with a chestnut band, costulate-striate above, base striulate, smoothish; whorls 6, somewhat convex, the periphery carinated, subgranular and suddenly deflected in front; peristome simple, subcontinuous. Diam. 6 mill.

Madeira.

It is *H. cyclostoma*, Menke.

H. leptosticta, Lowe. Pl. 8, fig. 25.

Rimately perforate, rather thin, rugulosely striate and slightly granular, diaphanous, corneous, obsoletely banded, suture impressed; whorls 5½, slightly convex, the last obsoletely angulated, descending in front, base hardly more convex; peristome simple, nearly continuous. Diam. 6·6 mill.

Madeira.

H. micromphala, Lowe. Pl. 8, fig. 26.

Rimately subperforate, somewhat solid, striulate and minutely granular, not shining, brownish, obsoletely darker banded; whorls 6, scarcely convex, the last dilated and shortly deflected in front, periphery subangulated, base more convex and smoother; peristome simple, margins approximating. Diam. 8 mill.

Deserta Islands, near Madeira.

H. DEALBATA, Lowe. Pl. 8, fig. 27.

Rimately perforate, solid, rugulosely striate and very minutely granular above, greyish white, apex corneous; whorls 5½–6½, scarcely convex, the last more or less distinctly carinate, with a corneous line below it, deflected in front, base a little convex, shining; aperture fulvous blue, peristome continuous, fulvous.

Diam. 8·5–10·5 mill.

Ins. Porto Sancto.

Var. *B.* Shell smooth, shining. *Ins. Ilheo de Baxo.*

H. FICTILIS, Lowe. Pl. 8, fig. 28.

Arcuately rimate, subperforate, somewhat solid, obliquely striate above, cinnamon color, sometimes with a single chestnut band; whorls 5, slightly convex, the last dilated and deflected in front, periphery obsoletely angulated, base more convex; peristome simple, continuous, shortly adnate. Diam. 7·5 mill.

Ins. Porto Sancto.

Section IV, ACTINELLA, Lowe. 1854.

H. LENTIGINOSA, Lowe. Pl. 8, fig. 29.

Moderately umbilicated, rather thin, rugulosely striate, with very short scales or hairs, not shining, chestnut color, maculated with lighter shade, suture impressed; whorls 4–4½, slightly convex, the last obtusely carinated, subdescending in front, base convex; peristome simple, margins approximating. Diam. 5·6 mill.

Ins. Madeira.

H. ARCTA, Lowe. Pl. 8, fig. 30.

Punctiformly perforate, closely, distinctly costulate, light corneous, marbled with white, maculated and obsoletely banded with chestnut; whorls 5½, rather flattened, periphery carinated, base more convex, suddenly, shortly deflected in front; aperture with a white entering tooth, peristome white, expanded, callous within, almost continuous.

Diam. 5 mill.

Ins. Madeira.

H. STELLARIS, Lowe. Pl. 8, fig. 31.

Narrowly umbilicated, rather thin, striate, shortly scaly hirsute, corneous brown, suture impressed; whorls 4, scarcely convex, the last shortly deflected in front, periphery carinated, base convex; peristome sublabiate within, margins approximating, slightly expanding.

Diam. 4·5 mill.

Ins. Madeira.

Is *H. lentiginosa, β.* of Albers.

[*Caseolus*, Lowe.]

H. SPHÆRULA, Lowe. Pl. 8, fig. 32.

Very minutely perforate or imperforate, rather solid, substriate, sparsely granulate, a little shining, smooth towards the apex, suture impressed; whorls 5–7, slightly convex, slowly increasing, the last suddenly deflected in front and a little contracted, periphery obsoletely angulated, base flattened; peristome subsimple, scarcely expanded, callous within at the base. Diam. 4·5–7 mill.

Porto Sancto; fossil in *Madeira*.

H. subcallifera, Lowe is a synomym.

H. CONSORS, Lowe. Pl. 8, fig. 33.

Subperforate, costulately granular above, smooth, striulate and shining below, variegated with white and chestnut, base paler; whorls 6, flatly convex, the last suddenly deflected in front, periphery obsoletely angulated; aperture white, peristome simple, with distant margins, Diam. 9 mill.

Ins. Porto Sancto.

H. CALCULUS, Lowe. Pl. 8, fig. 34.

Subperforate, solid, striulate, finely, closely granular throughout, yellowish ash color or chalky white, obsoletely double banded with chestnut, suture impressed; whorls 5½–6, somewhat convex, the last deflected in front, periphery bluntly angulated; peristome acute, subcontinuous, slightly expanded. Diam. 7–8 mill.

Ins. Porto Sancto.

It is *H. compacta*, *β*, of Albers.

H. COMPACTA, Lowe. Pl. 8, fig. 35.

Perforate, somewhat solid, costate-striate and granular above, striulate, smooth and shining below, variegated with white and corneous, with an obsolete brown band below; whorls 6, slightly convex, the last obsoletely angulated, scarcely descending in front; peristome simple, margins approximating. Diam. 6 mill.

Ins. Porto Sancto.

H. innominata, Gray is a synonym.

H. ABJECTA, Lowe. Pl. 8, fig. 36.

Perforate, solid, minutely granular, rugosely striate above, greyish, below with an obsolete chestnut band, spire elate; whorls 6½–7, the last subcarinated, suddenly deflected in front, base a little con-

vex; aperture brownish, peristome simple, continuous, white, shortly expanded. Diam. 6·6 mill.

Ins. Porto Sancto.

H. candisata, Menke is a synonym.

[*Rimula*, Lowe.]

H. ARRIDENS, Lowe. Pl. 8, fig. 46.

Perforate, thin light corneous, rugosely striate, hispid; whorls 5, planulate, the last shortly deflected in front, periphery carinated, base convex; peristome acute, margins distant. Diam. 6 mill.

Madeira.

H. FAUSTA, Lowe. Pl. 8, fig. 47.

Covered perforate, thin, rugosely striate, very shortly pilose, chestnut color, marbled with yellow, suture impressed; whorls 5, scarcely convex, the last carinate, deflected in front, base tumid; aperture with a deep parietal dentiform callus, base tumid; peristome acute, sinuously callous within the base. Diam. 6 mill.

Madeira.

Wollaston has indicated a var. *β*, *robusta*.

H. OBSERATA, Lowe. Pl. 8, figs. 37–39.

Imperforate, rather thin, obliquely striulate, a little shining, sparsely hispid, brownish, variegated with lighter color, suture scarcely impressed; whorls 5, flattened, slowly increasing, the last acutely carinated, shortly descending and crispate in front, base convex, paler, with a brown band; lip simple, margins remote, thickened and subsinuate within at the base, dilated over the umbilical region. Diam. 7 mill.

Madeira.

Wollaston gives a var. BIPARTITA.

H. ACTINOPHORA, Lowe. Pl, 8, figs. 42, 43.

Perforate, thin, rugosely striate, epidermis radiately laciniated, brownish; whorls 5, flattened, the last carinated, shortly descending in front, base convex; peristome simple, sublabiate within, margins remote. Diam. 9 mill.

Madeira; 3500 ft. alt.

Wollaston has indicated a var. DESCENDENS.

[*Lyrula*, Wallaston.]

H. USURPANS, Furtado. Pl. 8, fig. 48.

Narrowly umbilicated, somewhat solid, very closely, obliquely, undulately striated, with rare spiral striæ above, regularly decussated

below, not shining, maculated and tessellated with white and chestnut, suture well impressed; whorls 5, convex, regularly increasing, the last with carinated periphery, shortly deflected in front, base convex; peristome simple, acute, shortly reflected below, margins approaching. Diam. 5½–6½ mill.

Ins. Lanzarote.

Described by Lowe as *H. torrefacta*, a name preoccupied by C. B. Adams; therefore changed by Wollaston to *H. Loweana*, preoccupied by Ferussac; finally by Furtado, as above.

H. CALVA, Lowe. Pl. 8, figs, 40, 41.

Covered perforate, rather thin, diaphanous, costulate-striate above, smooth below, horny white, narrowly, obsoletely, doubly banded with chestnut; whorls 7, slightly convex, the last scarcely descending in front, periphery obsoletely angulated; peristome thin, subexpanded, white lipped within. Diam. 8·5 mill.

Madeira.

H. GALEATA, Paiva. Pl. 8, fig. 49.

Covered perforate, somewhat solid, obliquely costulate-striate and brownish corneous above, corneous white, smooth and shining below, with two obsolete brown bands, suture impressed; whorls 8, slightly convex, the last angulated, descending anteriorly, paler towards the aperture; peristome simple, white-lipped within, basally somewhat reflected, margins remote. Diam. 9 mill.

Madeira.

It is *H. calva*, var. *galeata*, Lowe.

H. VESPERTINA, Morelet. Pl. 9, figs. 65–67.

Perforate, thin, smooth, brownish corneous, with an obscure light band below the carina, closely, lightly striate; whorls 5–5½, moderately convex, slowly increasing, the last not deflected; peristome simple, margins remote, connected by a callus. Diam. 8 mill.

Ins. Terceira, Azores.

Unfigured Species.

H. CAPSELLA, Lowe. *Madeira.*

H. SPIRORBIS, Lowe. *Madeira and Deserta Australis.*

H. COMMIXTA, Lowe. *Porto Sancto.*

Section V. TECTULA, Lowe. 1854.

H. LYELLIANA, Lowe. Pl. 9, fig. 83.

Rimately perforate, solid, striulate, opaque, brownish above, marbled with white, with a narrow chestnut band, suture plane,

margined; whorls 8, flat, acutely carinated, the last subgibbous and shortly deflected in front, base convex, yellowish, with two (or rarely one) wide chestnut bands; peristome subsimple, thickened below.

Diam. 16 mill.

Ins. Deserta Grande, near Madeira.

It is *H. Bulverii*, var. *β*, of Albers.

H. Albersi, Lowe. Pl. 9, figs. 84–86.

Narrowly umbilicated, slightly granular, corneous, with chestnut bands, suture obsolete; whorls 8, narrow, slowly increasing, the last a little descending in front, periphery acutely carinated, base convex.

Diam. 14–16 mill.

Porto Sancto.

Smaller and paler colored than the next species, with less cylindrical umbilicus and less prominent carina, spire more rectilinear.

This is *H. Bulverii*, var. *β*, of Pfeiffer.

H. Bulverii, Wood. Pl. 9, fig. 88.

Narrowly umbilicated, somewhat solid, minutely striate, and very minutely granulated, fulvous, marbled and banded with chestnut, suture obsolete; whorls 8, flat, narrow, slowly increasing, the last acutely carinated, flatly convex below; peristome simple, thickened on the base. Diam. 17 mill.

Ins. Porto Sancto.

H. rota, Pot. et Mich., *H. Bulveriana*, Lowe. and *H. variegata*, Menke are synonyms.

H. tectiformis, Sowb. Pl. 9, figs. 89, 90.

Narrowly umbilicated, rather thin, calcareous, slightly striate above, closely granular beneath; whorls 7, planate, slowly increasing, the last acutely carinated, carina wide, deflected downwards; aperture trapezoidal, peristome acute, simple above, deflected at base.

Diam. 16 mill.

Ins. Baxo, near Porto Sancto.

Var. Ludovici, Albers. Fig. 90.

Somewhat larger, spire a little more dome-shaped, carina not so acute.

Semifossil, (extinct?).

H. argonautula, Webb and Berthelot. Pl. 9, figs. 91–93.

Moderately umbilicated, rather thin, closely costulate, ash colored with a single band above and another below, tessellated with white

and chestnut at the suture and carina; whorls 4½, scalar, crenately carinated, base smoother and more convex; peristome acute.

Diam. 8–9 mill.

Ins. Gran Canaria; *Morocco.*

Mousson has described a Morocco representative as Var. *typica* and given the Canary shell the title Var. *Canariensis*; whereas if there be any difference between them the Canary form as originally described should be regarded as typical.

H. PULVERULENTA, Lowe. Pl. 9, figs. 94–96.

Narrowly umbilicated, somewhat solid, granularly striate, brownish ash color, with one or two tessellated, interrupted bands; whorls 5, scalar, slightly convex, with simple suture, last whorl acutely, compressly carinated; peristome simple, margins subapproximating.

Diam. 6–7·5 mill.

Ins. Gran Canaria.

It is *H. argonautula*, in part, of Orb.

H. GRANOSTRIATA, Mousson. Pl. 9, figs. 97–99.

Narrowly umbilicated, somewhat solid, thinly costulate-striate, spirally sulcate, the reticulations forming elongated granules, greyish white, sometimes interruptedly bifasciate with chestnut, suture plane, subcarinate above; whorls 5, flat above, compressed carinate, carina minutely irregularly crenulated, last whorl scarcely descending in front, a little more convex and granularly striate below, shortly impressed at the carina; aperture white, peristome a little expanded, widely labiate within, margins approaching.

Diam. 10 mill.

Ins. Fuerteventura and Lanzarote.

H. MULTIPUNCTATA, Mousson. Pl. 9, figs. 100, 1.

Narrowly umbilicated, with engraved striæ and spiral lines, decussating into long, minute granules, maculated or marbled with whitish gray and white; whorls 4, somewhat convex, the last not descending, periphery angulated, base more convex; peristome simple, obtuse, a little expanded, margins joined by a slight callus.

Diam. 4·2 mill.

Ins. Fuerteventura, (subfossil).

H. MORATA, Mousson. Unfigured. *Ins. Fuerteventura* (subfossil).

Section VI. Craspedaria, Lowe. 1854.

H. delphinula, Lowe. Pl. 33, figs. 63, 64.

Rather widely, crenately umbilicated, widely carinated, spirally costellate and decussately cancellate below, reticulated by oblique and spiral lines above; yellowish white, chalky, whorls 7–8, subplanate, each fimbriately carinated; peristome angulated, a little expanded, subcontinuous. Diam. 18–23 mill.

Madeira, semifossil.

Section VII. Discula, Lowe. 1854.

H. tetrica, Paiva. Pl. 8, figs. 51–53.

Widely umbilicated, solid, roughly granular, whitish, broadly banded with, or totally dark chocolate color above; whorls 7, slightly convex, suture distinct, the last whorl carinated, a little depressed in front; peristome simple. Diam. 13–15 mill.

Ins. Deserta Australis, near *Madeira*.

H. polymorpha, Lowe. Pl. 8, figs. 56–64, 50, 44, 45, 54, 55; Pl. 9, figs. 68, 71–82, 89.

Widely umbilicated, striate, more or less roughened by close granulations, marbled with brown and white above, dirty white below, with a brown band; whorls 7–8, planulate, the last acutely carinated, subgibbous and suddenly deflected in front, base slightly convex, smoother; peristome simple, margins approximating, joined by a callus. Diam. 9–12 mill.

Madeira, Porto Sancto.

It is *H. elegantula*, Jan, *H. saccharata*, Lowe, *H. tæniata*, Reeve

Var. salebrosa, Lowe. fig. 50.

Spire a little elevated, scabrous, suture plane, base convex, umbilicus rather small.

Madeira, and Deserta Is.

Var. poromphala, Lowe. Fig. 62.

Scabrous, whorls slightly convex, umbilicus punctiform in the middle, becoming shortly rimate.

Ins. Deserta Australis.

Var Pittæ, Paiva. Figs. 60, 61.

Perforate, subglobose, rugose, closely granular; whorls 6½, the last obtusely angulated, base turgid; peristome thick, whitish, subreflected. Diam. 5 mill.

Ins. Deserta Australis.

Var. ALLENIANA, Paiva. Figs. 44, 45.

Lenticular, with acute keel, white below with a narrow chestnut band around the umbilicus and a broader one (sometimes two) towards the keel, above mottled with white and chestnut.

Madeira.

Var. LINCTA, Lowe. Figs. 54, 55.

Shortly pyramidal, granular above, smoothish below, umbilicus subpatulous, keel obtuse, colors as in preceding variety.

Madeira.

Var. ARENICOLA, Lowe. Figs. 63, 64.

Much smaller, somewhat thinner, and paler in color than the preceding variety.

Madeira.

It is *H. lincta*, var. *β*, *cinerea*, Lowe.

Var. BARBOSÆ, Paiva. Fig. 68.

Conical, acutely keeled, striate above, granular all over, darkly clouded above with dark brown and chestnut, with a livid tinge, below with irregular brownish markings next the periphery, the middle pale.

Porto Sancto.

Var. PULVINATA, Lowe. Figs. 71, 72.

Finely granular, whorls all a little exserted showing a sutural carina besides the peripheral one.

Porto Sancto.

Var. PAPILIO, Lowe. Figs. 73–76.

Whitish, substrigated or tessellated with chestnut, granular, base smooth, umbilicus minute, margins of peristome scarcely approaching.

Ilheo de Baxo, near Porto Sancto.

It is var *calcigena*, Lowe, and *H. testudinalis*, var. *minor*, Paiva.

Var. DISCINA, Lowe. Figs. 77–79.

Depressed, minutely reticulately granular, marbled with chestnut above, banded below; whorls subplanate, umbilicus large, spiral.

Porto Suncto.

Var. GOMESIANA, Paiva. Fig. 87.

Smaller than the preceding variety, more thickly granulated, keel not quite so sharp, more convex, darker above and less variegated, base more opaque, sides of umbilicus more abrupt.

Porto Sancto.

Var. ATTRITA, Lowe. Figs. 80–82.

Abruptly umbilicated, distinctly striated and minutely granulated, light corneous, densely marbled with chestnut above, base bifasciate; whorls 7, flattened, the last deflected in front, periphery obtusely angular, base much inflated round the umbilicus. Diam. 10 mill.

Porto Sancto.

H. TABELLATA, Lowe. Pl. 9, fig. 69.

Moderately umbilicated, thin, minutely rugose and granulated above, marbled with chestnut and white, spire subplane, suture impressed; whorls 5. flattened, slowly increasing, the last acutely carinated above, scarcely descending in front, base convex, smoothish, lighter color with a chestnut band; peristome simple, margins approaching. Diam. 7 mill.

Ins. Madeira.

H. TESTUDINALIS, Lowe. Pl. 9, fig. 70.

Rather widely umbilicated, somewhat solid, striulate and slightly granular, diaphanous, corneous with opaque white strigations and two chestnut bands; whorls 7, scarcely convex, the last carinated, tumid and deflected in front, base convex; peristome simple, margins approaching and joined by a callus. Diam. 19 mill.

Ins. Porto Sancto.

It is *H. Bulveriana*, var. of Reeve.

[*Turritella*, Woll.]

H. CHEIRANTHICOLA, Lowe. Pl. 9, figs. 2, 3.

Narrowly umbilicated, somewhat solid, rugosely striate and scaly granose, whitish, with a wide chestnut band at the suture, and a less distinct one on the base, suture impressed; whorls 8, convex, tumid, with angulated periphery, the last deflected in front; peristome acute, simple, margins approaching, joined by a callus.

Diam. 9·5 mill.

Ins. Porto Sancto, and Baxo.

Var. MUSTELINA, Lowe. Fig. 3.

Smaller, more uniformly and roughly granulated, whorls flatter, without keel, only obsoletely banded.

Connected with the type by intermediate forms according to Wollaston.

Section VIII, CALLINA, Lowe. 1854.

H. ROTULA, Lowe. Pl. 9, fig. 4.

Covered perforate, striate and granulate, granules oblong, a little shining, fulvous, marbled with yellow, with narrow chestnut bands,

suture linear; whorls 8, flattened, the last acutely angulated, base scarcely more convex, rounded in front, subgibbous, ochre color, suddenly deflected; peristome white, with an interior callus, basally subreflected, margins joined by a parietal callus.

Diam. 12 mill.

Ins. Porto Sancto.

Section IX. Acusta, Albers. 1860.

H. Selskii, Gerstfeldt. Pl. 10, figs. 5–7.

Very narrowly perforate, almost covered, thin, transparent, closely striate, a little shining, yellowish, three-banded with chestnut; whorls 5, rapidly increasing, the last ventricose, scarcely deflected in front; peristome acute. Diam. 20 mill.

Amur River, E. Siberia.

H. cincto-inflata, Mousson. Pl. 10, fig. 8.

Perforate, thin, pellucid, not shining, irregularly striate, decussated by minute lines, light brownish, with a dorsal narrow chestnut band, suture scarcely impressed; whorls 5½, rapidly increasing, somewhat convex, the last inflated, and subgranular on the base; peristome acute, thin. Diam. 32 mill.

Amur River, E. Siberia.

H. laeta, Gould. Pl. 10, figs. 13, 14.

Thin, shining, striate, with very thin spiral lines, greenish corneous, with a brown band on the periphery and another near the suture; whorls 5, ventricose; peristome acute, a little expanded, reflected at the umbilicus. Diam. 31 mill.

Hakodadi, Japan.

H. Sieboldtiana, Pfr. Pl. 10, fig. 9.

Scarcely perforate, thin, pellucid, striulate and very obsoletely subdecussated, corneous; whorls 5½, somewhat convex, the last ventricose; peristome simple, acute. Diam. 18 mill.

Japan, Formosa.

Is possibly a variety of *H. ravida*, Bens.

H. oscitans, Martens. Pl. 10, figs. 10–12.

Rimately perforate, slightly striulate, granular hairy, yellowish brown, suture impressed; whorls 4½, convex, the last a little descending, rounded; peristome simple, acute. Diam. 18 mill.

Japan.

H. RAVIDA, Benson. Pl. 10, fig. 15.

Narrowly umbilicated, thin, slightly rugosely plicate, with obsolete spiral lines, light olivaceous brown or yellowish brown; whorls 6, convex, the last inflated, slightly descending in front; peristome simple, acute, columellar margin dilated and reflected.

Diam. 33 mill.

Middle and Northern China.

H. helvacea, Phil. is a synonym.

Var. LINEOLATA, Mollendorff.

More conical, decussated, corneous yellow, aperture yellowish roseate. Diam. 23 mill., Alt. 26 mill.

Near Pekin and Kalgan, China.

Mr. E. A. Smith, in a paper on Loo Choo Shells (Proc. Zool. Soc. 317, 1887) remarks: *H. despecta, Gray*, (Manual, iii, 211), *H. ravida*, Benson, *H. Redfieldi*, *H. Sieboldtiana*, Pfr. and *H. assimilis*, A. Ad., are all very much alike and might well be considered varieties of one and the same species. In the series of eighteen specimens from Loo Choo I find considerable differences in form, some being much higher and more globose than others. One example is of a peculiar purplish brown color, and another is remarkable in having a thickening or limbus within the lip.

H. BURTINII, Desh. Fig. 16.

Smaller than *H. ravida*, with imperforate axis, columella thin, cylindrical, not dilated at the base. Diam. 23 mill.

China.

This may be only a phase of *H. ravida*, as suspected by some conchologists, but I think its distinctive characters sufficient.

H. PHRAGMITIUM, Heude. Pl. 10, fig. 20.

Perforation covered or nearly covered, shell thin, fragile, pellucid, lightly cancellated, greenish or brownish; whorls 6, convex, the last rapidly increasing; peristome simple, acute, thin, columellar margin dilated, reflected. Diam. 23 mill.

Blue River, China.

This form has been referred to *H. Burtinii* Desh., but is more depressed and differs in the umbilicus.

H. ASSIMILIS, H. Adams. Pl. 10, fig. 22.

Openly umbilicated, thin, irregularly striated and very closely, slightly decussated, subpellucid, shining, light fulvous; whorls 5½,

the last ventricose; peristome simple, acute, columellar margin arcuate, dilated, a little reflected. Diam. 22 mill.

Takow, Formosa.

H. RAVIDULA, Heude. Pl. 10, fig. 17.

Umbilicus nearly covered, shell thin, fragile, obsoletely striate-cancellate, amber colored, suture impressed; whorls 5½, convex, the last inflated, slightly descending; peristome simple, acute, columellar margin dilated and reflected over the umbilicus. Diam. 19 mill.

Tatsien, China, near the frontier of Thibet.

The shell differs but little from *H. ravida*, but the animal, according to Heude is entirely different, bluish with a white stripe on the middle of the neck.

H. REDFIELDI, Pfr. Pl. 10, figs. 18, 19, 21.

Narrowly umbilicated, thin, irregularly, flexuously striate, and very obsoletely decussated, diaphanous, shining, fulvous corneous; whorls 5½, convex, the last inflated, not descending in front; peristome simple, acute, margins remote, columella dilated half-covering the umbilicus. Diam. 17 mill.

Shanghai, China.

H. Frilleyi, Crosse and Debeaux (fig. 21), and *H. Huberiana*, Heude (fig. 19) are synonyms. *H. Burtinii*, Desh. is also possibly identical; although I have treated it as distinct.

H. MILIACEA, Martens Pl. 10, figs. 23, 24.

Subcovered perforate, very slightly striulate, a little shining, whitish?, suture well impressed; whorls 6, the last inflated, not descending in front; peristome simple, acute, columellar margin slightly thickened and reflected. Diam. 6 mill.

Ins. Amboina.

It is *H. milium*, Martens, preoccupied by Morse.

H. SARELII, Martens. Pl. 10, figs. 25–27.

With nearly covered umbilicus, striulate, corneous; whorls scarcely 4, rapidly enlarging, the last nearly equally convex above and below, deflected in front; peristome acute, a little thickened within, columellar margin rather widely deflected. Diam. 11·5 mill.

Prov. Szetschuen, China.

H. Nora, H. Adams. is a synonym.

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H. Kraussi, Pfr. Pl. 10, fig. 30.

Moderately umbilicated, closely striate, brownish corneous, suture well impressed; whorls 4½; rapidly increasing, the last wide, subdepressed, deflected in front; peristome simple, acute, columellar margin dilated, reflected. Diam. 29 mill.

Cape of Good Hope.

Var. β. Smaller, thin. Diam. 21 mill.

H. marcescens, Cox. Pl. 10, figs. 28, 29.

Narrowly umbilicated, thin, translucent, a little shining, slightly rugosely striate, and faintly granular, yellowish corneous, with a narrow chestnut sutural band; whorls 5, slowly increasing, the last wide; peristome acute, the columellar margin dilated and strongly reflected above. Diam. 16 mill.

Clarence River, N. S. Wales, Australia.

H. physeta, Ancey. Unfigured. *Thibet.*

Group VIII, PLECTOTROPIS.

Shell flattened, rather thin, sculpture usually rough, riblike or granular, sometimes with shaggy epidermis, peristome simple, or a little expanded, thickened within, umbilicus wide.

A group composed of somewhat incongruous elements, characteristic mainly of the Chinese and Japanese provinces. The connection with Camæna or Hadra is so close, through some of the species that the separation is rather arbitrary than natural.

Section I. Plectotropis, Albers. 1860.

Shell flat, somewhat lenticular, thin, widely umbilicated, periphery carinate, and shaggy, peristome simple, a little thickened within.

Eastern Asiatic. H. Mackensii, Ads. and Reeve.

Thea, Albers, is a synonym.

Subsection Pseudiberus, Ancey. 1887.

More coarsely sculptured, peristome thicker and whitish.

H. plectotropis, Mart. *China, Turkestan.*

Section II. Aegista, Albers. 1850.

Shell depressed, widely umbilicated, thin, uniform corneous, roughly sculptured, periphery rounded, or obtusely angulated, peristome slightly expanded, a little thickened within.
Eastern Asiatic. H. oculus, Pfr.

Section III, Trachia, Albers. 1860.

Shell small, depressed, moderately or rather widely umbilicated, thin with granular sculpture, last whorl deflected and constricted in front, periphery rounded, peristome a little expanded, thickened within, its margins approaching and connected by a thin parietal callus. *Indo–Pacific.* H. asperella, Pfr.

Subsection Angasella, Adams. 1863.

Shell small, depressed, widely umbilicated, with strong, rib-like sculpture, periphery rounded, margins of peristome approaching.
H. cyrtopleura, Pfr. *Australian.*

Ancey has changed the name to *Pleuroxia*, on the ground that *Angasella* is preoccupied in marine shells, but Crosse's *Angasiella* in Nudibranchiata bears date 1864.

Section I. Plectotropis, Albers. 1860.

H. horiomphala, Pfr. Pl. 11, figs. 31–33.

Widely umbilicated, thin, slightly but closely decussated by oblique striæ and concentric lines, suture linear; light corneous, diaphanous, scarcely shining; whorls 6½, the last not descending in front, acutely carinated, base more convex, the umbilicus bounded by an angle; peristome simple, acute. Diam. 25 mill.

Japan.

H. Cathcartæ, Reeve. Pl. 11, fig. 44.

Widely, excavately umbilicated, arcuately rugosely striated, reddish corneous; whorls 6, flattened above, thinly margined at the suture, periphery compressly carinated, convex below; periphery acute. Diam. 27 mill.

Typinsan Isl. China Sea.

H. ELEGANTISSIMA, Pfr. Pl. 11, fig. 45.

Widely umbilicated, thin, distantly subplicate above, diaphanous, scarcely shining, yellowish, suture denticulately margined, scarcely impressed; whorls 6½, the last not descending in front, with a ciliate, denticulate, acute carina; peristome white, simple, a little expanded, columella short, subvertical. Diam. 24 mill.

Loo Choo and Typinsan Is.

Closely related to, perhaps a mere variety of the preceding species. It is *H. pretiosa, Albers.*

H. HOWARDI, Angas. Pl. 12, figs. 96–98.

Moderately umbilicated, rather solid, obliquely irregularly striate, and slightly, very minutely granular, yellowish corneous, with two indistinct chestnut bands; whorls 4½, slightly convex, the last a little descending in front, base more convex, without bands, periphery acutely carinated; peristome white, chestnut color at the junction with the body, slightly expanded. Diam. 22 mill.

450 miles N. of *Adelaide, Australia.*

H. MACKENSII, Adams and Reeve. Pl. 11, fig. 34.

Widely umbilicated, thin, closely arcuately striate above, epidermis hairy on the peripheral carina, brownish corneous; whorls 6½, scarcely convex above, slowly increasing, the last shortly deflected in front, periphery acutely carinated, base slightly striate, turgid around the umbilicus; peristome thin, somewhat expanded above, shortly reflected below. Diam. 30 mill.

Ins. Typinsan, China Sea.

H. GERLACHI, Mollendorff. Pl. 11, figs. 35–37.

Widely umbilicated, subobliquely interruptedly striulate, very slightly spirally lineolate, brownish, suture superficial; whorls 6, flattened, the last with hairy carina, slightly descending in front, convex below and angular round the umbilicus; peristome simple, a little reflected below. Diam. 19–21 mill.

Canton, China.

Var. GRANULOSO-STRIATA, Mart.

Pale. Diam. 21 mill.

Var. ABRUPTA, Mart.

Smaller, striæ interrupted, brownish. Diam. 19 mill.

Var. HUNANCOLA, Gredler. Undescribed.

H. LACINIOSULA, Heude. Pl. 11, figs. 38–40.

Widely umbilicated, thin, subpellucid, fulvous corneous, plicately, laciniately striate, hairy, especially at the suture and carina; whorls 6, slowly increasing, periphery acutely carinate; peristome white, slightly expanded. Diam. 30 mill.

Ouyuan and Tonglieou, China.

Described as *H. laciniosa*, preoccupied by Lowe.

H. TRICHOTROPIS, Pfr. Pl. 11, figs. 41–43, 46–48.

Widely umbilicated, thin, striulate, very minutely, slightly decussated by impressed spiral lines, diaphanous, light corneous or brownish; whorls 6½, flattened, the last with acute, ciliated periphery, base more convex; peristome simple, a little expanded above, reflected below. Diam. 17 mill.

Shanghai, China.

Var. LACINIATA, Heude. Figs. 46–48.

Shell more depressed above, the carina more obtuse, umbilicus rather wider.

H. MELLEA, Pfr. Pl. 11, fig. 58.

Moderately umbilicated, rather thin, slightly, very minutely granular, somewhat shining, light fulvous; whorls 5, somewhat flattened above, the last scarcely descending in front, periphery carinated, base somewhat turgid; peristome white, narrowly expanded above, subreflected and internally thickened at the base.

Diam. 22 mill.

Ins. Formosa.

H. EMMA, Pfr. Pl. 11, figs. 59–61.

Narrowly umbilicated, rather thin, closely, irregularly, rugosely striate, obsoletely spirally lirate above, not shining, variegated with flesh-color and white, suture linear; whorls 4, rather flattened above, the last acutely carinated, scarcely descending, base convex; peristome thin, expanded above, reflected below. Diam. 18 mill.

Lao Mts., Cambodia.

H. TAPEINA, Benson. Pl. 12, figs. 71, 72, 77.

Widely umbilicated, slightly granularly striate, not shining, light brownish, suture thread-like; whorls 6, somewhat flattened, slowly enlarging, the last descending in front, base convex, angulate around the umbilicus; peristome simple, white, dextrally a little expanded.

Diam. 15·5 mill.

Bengal, Java, China.

Var. ROTATORIA, Busch. Fig. 77.

Suture less distinct, periphery acutely keeled; peristome a little thickened, less rounded, white.

Var. BHAMOENSIS, Nevill.

Last whorl slightly angular, not distinctly keeled, aperture smaller, less produced, columellar margin slightly oblique, angular at base, shell smoother.

Nevill remarks that this variety connects *H. tapeina* almost insensibly with *H. catostoma*, Blf. and its varieties.

H. HUPENSIS, Gredler. Pl. 13, fig. 48.

Widely umbilicated, thin, obliquely striate, carinate, suture margined; whorls 6½, flattened, brownish above, whtish-rayed below, last whorl not descending in front, base convex, subangulated around the umbilicus; peristome white, shortly reflected.

Diam. 20 mill.

Patong, Ost-Hupé Mts., China.

H. HUTTONI, Pfr. Pl. 11, figs. 56, 53–55.

Rather widely umbilicated, subdiaphanous, with scabrous epidermis, light corneous; whorls 6½, slightly convex, the last very slightly descending in front, periphery angulated; peristome simple, acute.

Diam. 10 mill.

Himalaya Mts., India; Java, etc.

H. orbicula, Hutton (not Orb.) is a synonym.

Var. SAVADIENSIS, Nevill.

Spire more elevated, shell thicker, umbilicus narrower.

Diam. 12·5 mill.

Var. WINTERIANA, Pfr. Figs. 53–55.

Widely umbilicated, depressed, light corneous, somewhat shining, periphery obsoletely or distinctly angulated; whorls 5½, the last slightly descending in front. Diam. 12 mill.

Java, Borneo, Sumatra, Timor, Siam.

H. INTUMESCENS, Mart. Pl. 11, figs. 64–66.

Moderately umbilicated, striated, a little shining, light brownish, peripheral carina whitish; whorls 5–6, slightly convex, the last somewhat deflected in front, carinated, the carina evanescent towards the aperture, base obtusely angulated around the umbilicus; peristome shortly expanded, white, columellar margin subvertical.

Diam. 8–14 mill.

Java.

H. SHANGHAIENSIS, Pfr. Pl. 11, fig. 57.

Moderately umbilicated, thick, obliquely submembranously striate, somewhat shining, brownish corneous; whorls 7, slightly convex, slowly enlarging, the last not descending, periphery carinated, base convex, granular and subhispid; peristome simple, subreflected at the base. Diam. 13 mill.

Shanghai, China.

H. CILIOSA, Pfr. Pl. 12, fig. 82.

Widely umbilicated, rather thin, striulate and very shortly hairy, diaphanous, brownish; whorls nearly 6, slightly convex, slowly increasing, the last with a ciliated carina; base somewhat inflated, convex; peristome simple, shortly expanded. Diam. 10 mill.

China, Japan.

H. BARBOSELLA, Heude. Pl. 12, figs. 9–12.

Moderately umbilicated, thin, brownish, with shaggy epidermis, suture superficial; whorls 6, slowly increasing, last whorl with angulated periphery, scarcely deflected at the aperture; peristome thin, a little expanded. Diam. 11 mill.

Shanghai and Great Lake, China.

H. LEPIDOSTOLA, Heude. Pl. 12, figs. 89–91.

Rather widely umbilicated, brownish, obliquely lamellarly plicate; whorls 6–6½, slowly increasing, the last scarcely descending in front, obsoletely angulated and fasciate on the periphery, base convex; peristome a little thickened, expanded. Diam. 15 mill.

Prov. Houpé, China.

Var. TROCHOSPIRA, Moll.

Smaller, spire more elevated, whorls 7, periphery distinctly angulated. Diam. 11·5 mill.

Prov. Hubei, China.

H. PHAYREI, Theob. Pl. 12, fig. 78.

Widely umbilicated, obliquely costulate-striate above, striæ finer below, suture impressed; whorls 5, rather convex, the last a little descending in front, periphery obtusely angulated, base convex; peristome simple, slightly expanded, margins approximating.

Diam. 15 mill.

Ava.

H. ANCYLOCHILA, Crosse. Pl. 12, fig. 67.

Moderately umbilicated, somewhat thin, subdiaphanous, irregularly obliquely striate, light yellowish olivaceous, suture impressed; whorls 4½, flattened above, the last descending in front, subacutely

carinated, inflated and scarcely striate below; peristome simple, expanded, white, margins distant. Diam. 16·5 mill.

Hab. unknown.

H. CONELLA, A. Ad. Pl. 12, figs. 79–81.

Moderately umbilicated, yellowish corneous, thin, obliquely costulate, epidermis in oblique interrupted lines; whorls 6, flattened, the last with acutely carinated periphery, base convex; peristome acute, expanded. Diam. 10 mill.

Tabu-Sima, Japan.

H. SUMATRANA, Martens. Pl. 12, figs 68–70.

Widely umbilicated, striulate, somewhat shining, greyish brown; whorls 5, scarcely convex, periphery carinated, base convex; obsoletely angulate round the umbilicus; peristome simple, white, expanded below. Diam. 13 mill.

Sumatra.

Var. MOUSSONIANA, Mart.

Very widely umbilicated, closely arcuately striate, shining, light brownish, peripheral carina distinct; peristome white, shortly expanded. Diam. 12 mill.

Eastern Java.

H. SQUAMULOSA, Mousson. Pl. 12, figs. 74–76.

Widely umbilicated, closely arcuately striated, epidermis brownish, scaly, laciniated, in lines parallel with the striæ; whorls 6, subplane, deflected in front, periphery carinated, base slightly convex, with distinct umbilical angle; peristome white, shortly expanded. Diam. 12 mill.

Ins. Madura, near Java.

H. PUBEROSULA, Heude. Pl. 12, figs. 86–88.

Widely umbilicated, fragile, epidermis reddish brown, with minute granose scales, suture subimpressed; whorls 8, narrow, slowly increasing, periphery obtusely angulated; peristome thin, a little reflected. Diam. 10 mill.

Distr. Talifou, China.

Described by Heude as *H. pulverulenta*, preoccupied by Lowe.

H. ATKINSONI, Theobald. Pl. 12, figs. 83–85.

Widely umbilicated, rugosely striate, lightly decussated by obscure spiral lines, dirty white (perhaps corneous in fresh specimens), semitranslucent, suture impressed; whorls 5, slightly convex, the last sinuately depressed above at the aperture; peristome slightly thickened, simple, callously thickened on the base. Diam. 13 mill.

Moulmein.

H. PERPLANATA, Nevill. Pl. 13, figs. 49–51.

Shell widely umbilicated, flattened on the top, convex below, periphery distinctly carinated; whorls 7, slowly increasing, striate above, smooth below. Diam. 16 mill.

Upper Burmah.

No diagnosis has been published; the above particulars are gleaned from some remarks upon the species published by its author.

H. AKOWTONGENSIS, Theobald. Pl. 12, fig. 73.

Widely umbilicated, rather thin, light corneous, densely granular, with a thin sub-bristly epidermis; whorls 5, flattened, the last shortly deflected in front, acutely carinated, base tumid around the umbilicus; peristome thin, margins approaching, a little expanded above, reflected at the base. Diam. 15 mill.

Akowtong, Province of Pegu.

My figure (from Conch. Indica), which corresponds with the description, and considerably resembles the preceding species, is said, nevertheless, not to represent it. No other figure has been published.

H. GABATA, Gould. Pl. 14, figs. 82, 83.

Rather widely umbilicated, somewhat thin, slightly striate, somewhat shining, whitish corneous, carina chestnut banded; whorls 4½ somewhat flattened above, the last shortly descending in front, periphery carinated, base tumid around the umbilicus; peristome white, expanded and a little reflected. Diam. 23 mill.

Tavoy, Burmah.

H. Merguiensis, Phil. (fig. 83), is a synonym.

H. SMITHII, Bock. Pl. 11, figs. 62, 63.

Moderately umbilicated, semitransparent, striated by fine growth lines, greyish white under a light horn-colored epidermis; whorls 4, flattened, the last slightly descending at the mouth, with a strongly marked obtuse keel, defined by a groove above, convex below, obtusely angular around the umbilicus; peristome thin, expanded. Diam. 21 mill.

Paio, Sumatra.

H. RADULELLA, Heude. Pl. 12, figs. 92–95.

Widely umbilicated, epidermis reddish brown, covered by wart-like scales, with a light peripheral zone, suture impressed; whorls 6, the periphery obtusely angulated; peristome acute, scarcely reflected. Diam. 13 mill.

Talifou, China.

With columellar plication.

H. GONIOCHILA, Pfr. Pl. 11, figs. 51, 52.

Moderately umbilicated, somewhat solid, lightly striulate and granular, subdiaphanous, pale corneous; whorls 6½, narrow, slightly convex, the last not descending, acutely carinated, base more convex; peristome sublabiate, sulcate exteriorly, columella transversely uniplicate. Diam. 13 mill.

Siam.

H. PTYCHOSTYLA, Mart. Pl. 33, figs. 65–67.

Moderately umbilicated, somewhat solid, striate, brownish; whorls 6½, slightly convex, slowly increasing, the last obtusely carinated, base convex; peristome white, expanded, columellar margin almost perpendicular, transversely uniplicate. Diam. 14 mill.

Siam.

H. STYLOPTYCTA, Pfr. Pl. 11, figs. 49, 50.

Widely umbilicated, rather solid, closely striulate, diaphanous, greyish corneous; whorls 6, moderately convex, the last obsoletely angulated, not descending in front; peristome white-lipped, margins approaching, joined by a callus, expanded above and below, columella transversely plicate. Diam. 9 mill.

Siam.

A var. DEPRESSIOR has been indicated. This species is the *H. ptychostyla* of Pfr., not Martens; but is perhaps only a variety of Martens' species.

Subsection PSEUDIBERUS, Ancey. 1887.

H. PLECTOTROPIS, Martens. Pl. 12, figs. 3–5.

Moderately umbilicated, strongly, distantly, obliquely ribbed, whitish; whorls 5½, flattened above, carinate, carina crenulated, angulating the last whorl, slightly descending at the aperture, base a little convex; peristome expanded, margins approaching, connected by a thin callus. Diam. 19 mill.

Mts. Thianschan, Central Asia.

H. SCEPASMA, Pfr. Pl. 13, fig. 33.

Moderately umbilicated, solid, opaque, white, rugulosely striate, suture subimpressed; whorls 7, scarcely convex, slowly increasing, the last a little descending in front, periphery acutely carinated, base turgid around the umbilicus; peristome subthickened, angularly reflected. Diam. 20 mill.

Hab. unknown.

H. ARANEÆTELA, Heude. Pl. 12, figs. 99–1.

Rather widely umbilicated, thin, yellowish brown, strongly costate, sparsely scaly, suture impressed; whorls 5, slowly increasing; peristome acute, scarcely expanded. Diam. 9 mill.

Tchenkeou, China.

H. MATAIENSIS, Nevill. Pl. 12, figs. 6–8.

Moderately umbilicated, costulate above, less strongly below, white, irregularly mottled with pale corneous, suture well impressed; whorls 5½, the last only carinated; peristome simple, expanded. Diam. 13·5 mill.

Mataian, E. Turkestan.

H. TECTUM-SINENSE, Mart. Pl. 12, fig. 2.

Perforate, with strong, curved, somewhat distant ribs above, sometimes branching, below the ribs are closer, anastomosing; whorls 5½, undulately carinated, last whorl a little descending in front; peristome thickened, expanded. Diam. 16·5–21 mill.

Prov. Shantung, China.

H. ZENONIS, Gredler. (Unfigured.) *Tsinanfu, China.*

Unfigured Species of Plectotropis.

H. TROCHULA, H. SCABRICULA, H. SETOCINCTA, A. Adams. *Japan.*
H. MICROTROCHUS, H. APPLANATA, Moll. *China.*
H. SQUAMULIFERA, Moll. *Ins. Bongao, near Borneo.*
H. OSBECKII, Phil. *Loo Choo Is.*
H. REPANDA, Pfr. *Cambodia.*
H. CASEUS, Pfr. *Siam.*
H. PILISPARSA, Martens. *Celebes.*

Section II. AEGISTA, Albers. 1850.

H. OCULUS, Pfr. Pl. 13, fig. 13.

Widely umbilicated, rather thin, closely rugosely plicate above, brownish, suture impressed; whorls 8, somewhat convex, the last shortly descending in front, periphery subangular, white banded, base convex, striate; lip thin, subangulately reflected. Diam. 25 mill.

Ins. Typinsan and Meikoshima, China Sea.

H. Typinsana, Ads. and Reeve, is a synonym.

H. Chinensis, Phil. Pl. 13, fig. 14.

Widely umbilicated, shining, subpellucid, striated, light fulvous above, whitish beneath, epidermis thin, very fugacious; whorls 8, convex, slowly increasing; peristome white, sublabiate, shortly reflected. Diam. 25 mill.

Near Nankin, China.

H. vermes, Reeve. Pl. 13, fig. 15.

Very widely umbilicated, solid, closely rugosely striate, shining fulvous horny, with a white peripheral line, whorls 8, slowly increasing, flattened, the last scarcely deflected in front, periphery subangulated; peristome thin, whitish, reflected. Diam. 32 mill.

China.

Has been considered a variety of *H. Chinensis*, but differs considerably from that species, in its more depressed form, wider umbilicus, etc.

H. pseudo-Chinensis, Mollendorff. Pl. 13, figs. 16–18.

Widely umbilicated, thin, closely obliquely striate, subpellucid, somewhat shining, rosy horn color; whorls 8, slowly increasing, slightly convex, suture impressed, last whorl a little deflected in front; peristome reddish, widely reflected. Diam. 27 mill.

Dist. Hochan, China.

This is *H. Chinensis*, Heude, not Phil.

H. herpestes, Heude. Pl. 13, figs. 22–24.

Widely umbilicated, brownish corneous, with an obscure whitish corneous band, epidermis brownish or whitish, closely obliquely striate; whorls 7, slowly increasing, the last obsoletely angulated; peristome white, narrowly reflected. Diam. 22 mill.

Tchenkeou, China.

H. furtiva, Heude. Pl. 13, figs. 19–21.

Moderately umbilicated, corneous, striate, suture slightly impressed; whorls 6, slowly increasing, the last narrow, with obsoletely angulated periphery; peristome white, expanded. Diam. 19 mill.

Prov. Kouetcheou, China.

H. Aubryana, Heude. Pl. 13, figs. 45–47.

Widely umbilicated, thin, obliquely striate, brownish white, suture impressed; whorls 7, slightly convex above, periphery obtusely angulated, deflected in front, more convex on the base; peristome thin, white, reflected. Diam. 21 mill.

Prov. Kouetcheou, China.

H. ACCRESCENS, Heude. Pl. 13, figs. 26–28.

Widely umbilicated, thin, pellucid corneous, with a whitish peripheral band; whorls 7, narrow, slightly convex, slowly increasing, the last obtusely angulated, peristome white, narrowly reflected.

Diam. 16 mill.

Outchang, China.

Heude thinks this may prove a minor variety of *H. vermes.*

H. OLDHAMI, Benson. Pl. 13, fig. 25.

Widely umbilicated, thin, irregularly obliquely flexuously striate, corneous (?), suture impressed; whorls 6½, slowly increasing, subplanulate, the last whorl shortly and rapidly descending in front, obtusely angulated above, base convex, angular around the umbilicus; peristome a little expanded, margins approaching.

Diam. 13 mill.

Burmah.

H. FRIEDELIANA, Martens. Pl. 13, figs. 29–31.

Widely umbilicated, slightly obliquely striate, olivaceous brown; whorls 5½, scarcely convex, the last subangulated, deflected in front, base convexly flattened; peristome white, slightly thickened, expanded, margins approaching. Diam. 18 mill.

Nagasaki, Japan.

H. CIRCULUS, Pfr. Pl. 13, fig. 32.

Moderately umbilicated, solid, rugulosely striate, somewhat shining, white; whorls 5½, convex, the last obsoletely angulated, not descending; peristome thickened within, shortly expanded, margins approaching. Diam. 19 mill.

Loo Choo Is.

H. ALPHONSI, Desh. Pl. 13, figs. 34, 35.

Widely umbilicated, thin, fragile, corneous, brownish, yellowish-white, obliquely lineated and irregularly punctate, subplicate and spirally substriate above, smooth below; whorls 7, narrow, the last a little deflected in front, obtusely angulated above; peristome sinuous, reflected, columellar lip wide, with tooth-like thickening.

Diam. 9 mill.

Prov. Moupin, Eastern Thibet.

H. PLATYOMPHALA, Mollendorff. Pl. 13, fig. 44.

Very widely umbilicated, thin, subpellucid, corneous, closely obliquely striated, suture well impressed; whorls 7, subconvex, the last obsoletely angulated above, with a whitish zone, and very

shortly deflected in front, umbilicus bounded by a distinct angle; peristome thickened, white, reflected. Diam. 17·5 mill.

Prov. Guangdung, China.

H. SUBCHINENSIS, Nevill. Pl. 33, figs. 68, 69.

Widely umbilicated, subpellucid, obliquely striulate, shining, chestnut color, with a narrow white band; whorls 7, slightly convex, the last scarcely descending in front, subangulate on the periphery; peristome thickened, whitish, narrowly reflected.

Diam. 17 mill.

Formosa.

H. GOTTSCHEI, Mollendorff. Pl. 13, figs. 38–40.

Widely umbilicated, lightly obliquely striate and membranously costulate, microscopically spirally lineate, brownish corneous; whorls 6½–7, slightly convex, the last obtusely angulated, and very shortly deflected in front; peristome thin, shortly expanded, subreflected.

Diam. 11 mill.

Soul, Corea.

H. INITIALIS, Heude. Pl. 13, figs. 41–43.

Moderately umbilicated, thin, corneous or brownish, very minutely obliquely striate; whorls about 6, narrow, slightly convex, the last with obtuse, white-banded peripheral angle, scarcely deflected at the aperture, convex below; peristome white, sinuous, somewhat thickened, reflected. Diam. 12 mill.

Prov. Nganhoue, China.

H. CATOSTOMA, Blanf. Pl. 13, figs. 36, 37.

Widely umbilicated, thin, striate, corneous; whorls 7, convex, slowly increasing, the last rounded, abruptly descending in front, subconstricted behind the aperture, subcompressed around the umbilicus; peristome sinuous, reflected, with a superior internal projection, and basal, subdentiform thickenings. Diam. 16 mill.

Ponsee, Yunnan, Naga Hills, India.

Differs from the other species in its indistinctly trilobed aperture.

Unfigured Species.

H. HUPEANA and H. KUANTUNGENSIS, Gredler. *China.*

Section III. TRACHIA, Albers. 1860.

H. ASPERELLA, Pfr. Pl. 14, fig. 58.

Moderately umbilicated, roughened by minute granules, dirty white, variously banded with chestnut; whorls 4, the last with

rounded periphery, a little descending in front, base convex; peristome expanded, margins approximating. Diam. 14 mill.

Var. *minor*. Diam. 7 mill.

Eastern India.

It is *H. granifera*, Benson, Ms.

H. PROXIMA, Fer. Pl. 14, fig. 72.

Moderately umbilicated, lightly striate, shining, white, base brownish, lineated with brown; whorls 5½, the last rounded, deflected in front; aperture brownish, peristome expanded, reflected below, margins joined by a callus. Diam. 24 mill.

Eastern India.

H. PENANGENSIS, Stoliczka. Pl. 14, figs. 52–54.

Moderately umbilicated, thin, corneous, epidermis yellowish brown, closely, shortly pilose, suture deep, subchanneled; whorls 4½, convex, the last a little descending at the aperture, base obtusely angulated round the umbilicus; peristome light violaceous, expanded, narrowly reflected. Diam. 16 mill.

Penang.

H. PROPINQUA, Pfr. Pl. 14, figs. 55–57.

Rather narrowly umbilicated, thin, striulate, whitish or light brownish, with a superior narrow chestnut band; whorls 4–5, the last rounded, anteriorly deflected; peristome white, sublabiate, expanded. Diam. 16–19 mill.

Near Bombay, India.

H. HELFERI, Benson. Pl. 14, figs. 59, 60.

Narrowly, perspectively umbilicated, foveolate and obliquely striulate, epidermis sparsely hispid, brownish, with a narrow superior chestnut band, suture impressed, submargined; whorls 4½, slightly convex, the last descending in front, obsoletely angulated above the periphery, a little compressed around the suddenly excavated umbilicus; peristome expanded, margins approximating, joined by a thin callus. Diam. 12 mill.

Andaman Is.

H. RUGINOSA, Fér. Pl. 14, figs. 65–67.

Moderately umbilicated, whitish, obliquely plicate; whorls 4, flattened above, the last shortly deflected in front, periphery subangulated, base inflated; peristome thin, white, shortly expanded, reflected below. Diam. 13 mill.

Bengal.

Var. CRASSICOSTATA, Benson. Fig. 67.

Spire subplane, plications stronger, periphery crenulately carinated.

H. FOOTEI, Stoliczka. Pl. 14, fig. 84.

Moderately umbilicated, granose, plicate; whorls 4–4½, whitish, gradately increasing, the last carinated on the periphery, base convex, subangulated around the umbilicus; aperture almost horizontally deflected, the margin reflected, almost free.

Diam. 13·3 mill.

Belgaom, Western India.

Allied to the var. *crassicostata* of *H. ruginosa*, but is more orbicular, with smoother and thinner, but well-marked keel, and has an angle defining the umbilicus.

H. DELIBRATA, Benson. Pl. 14, figs. 75–77.

Moderately umbilicated, striate, epidermis corneous, deciduous, whorls 4, convex, the last deflected in front; peristome nearly continuous, white, thickened, reflected. Diam. 22 mill.

Bengal; *Tavoy, Burmah.*

H. procumbens, Gould, is a synonym.

Var. FASCIATA, Godwin Austen. Fig. 76.

Somewhat smaller, with deeper suture, variously narrowly chestnut banded.

Var. KHASIENSIS, Nevill. Fig. 77.

Spire more elevated, umbilicus narrower, aperture more contracted, usually unicolored, sometimes with a single chestnut band.

H. TANQUEREYI, Crosse and Fischer. Pl. 14, figs. 73, 74.

Rather widely umbilicated, obsoletely striate, thin, pellucid, light corneous; whorls 4½, slightly convex, the last descending in front, carinated above the middle, convex below and angulated around the umbilicus; peristome expanded, reflected, margins closely approaching. Diam. 12–14·5 mill.

Fuyen-Moth, Cochin China.

H. FALLACIOSA, Fér. Pl. 14, figs. 68, 69.

Rather widely umbilicated, striate, whitish, unicolored or variously chestnut banded, suture deep; whorls 4½, the last suddenly descending in front; aperture subhorizontal, peristome expanded above, reflected below. Diam. 11–18 mill.

Eastern India, Ceylon.

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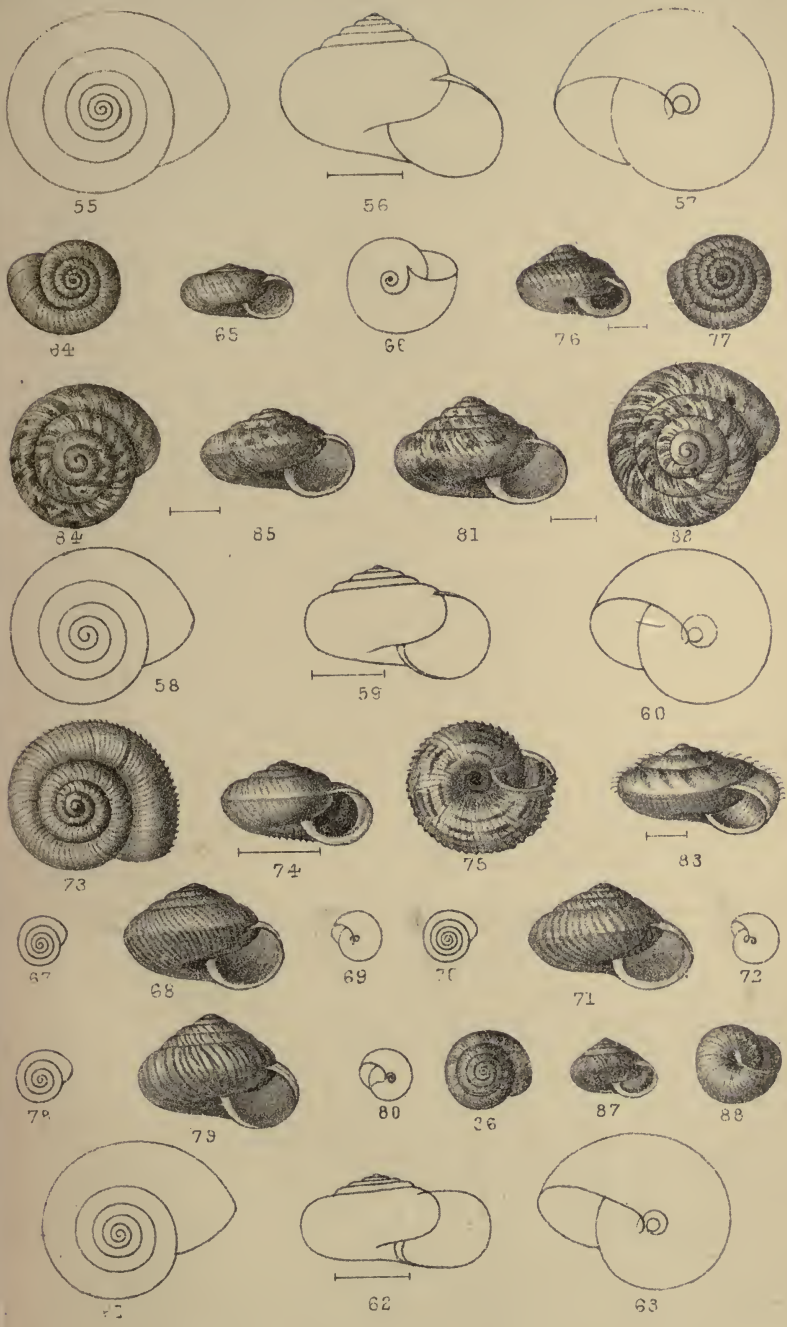
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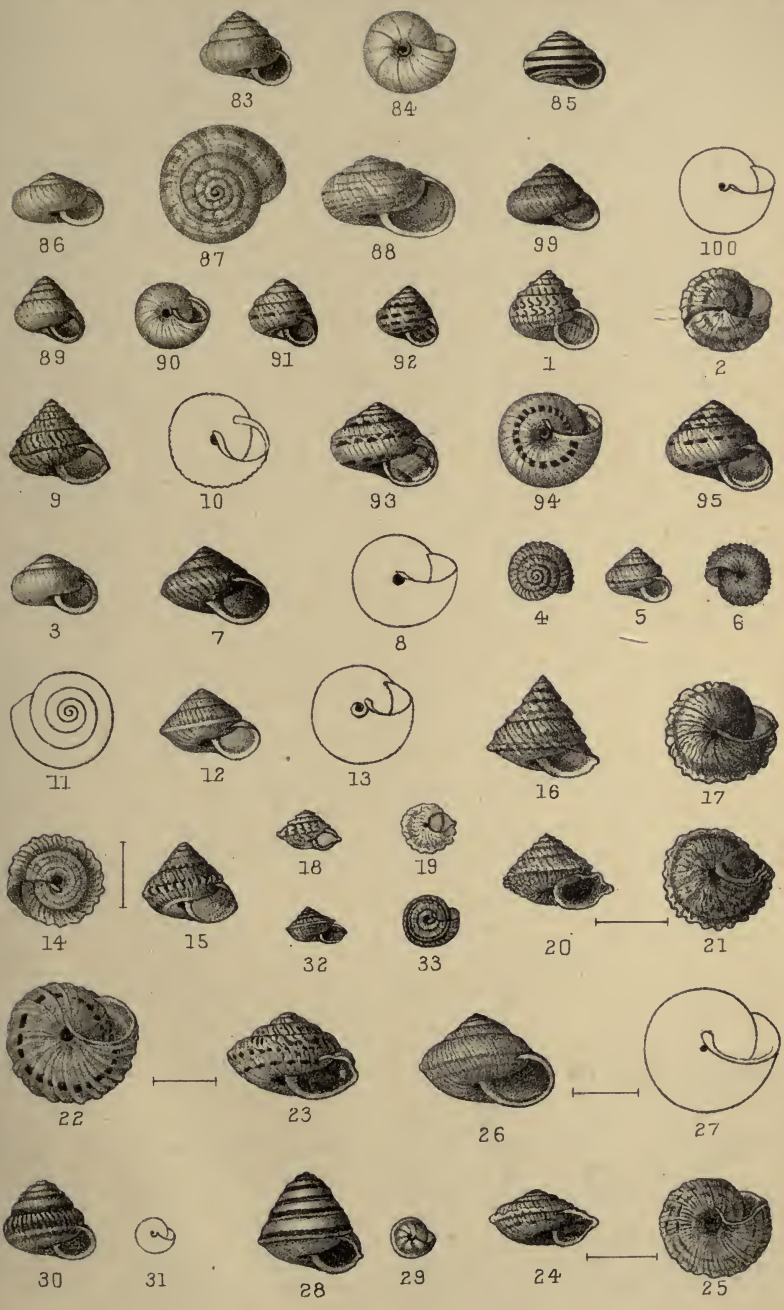
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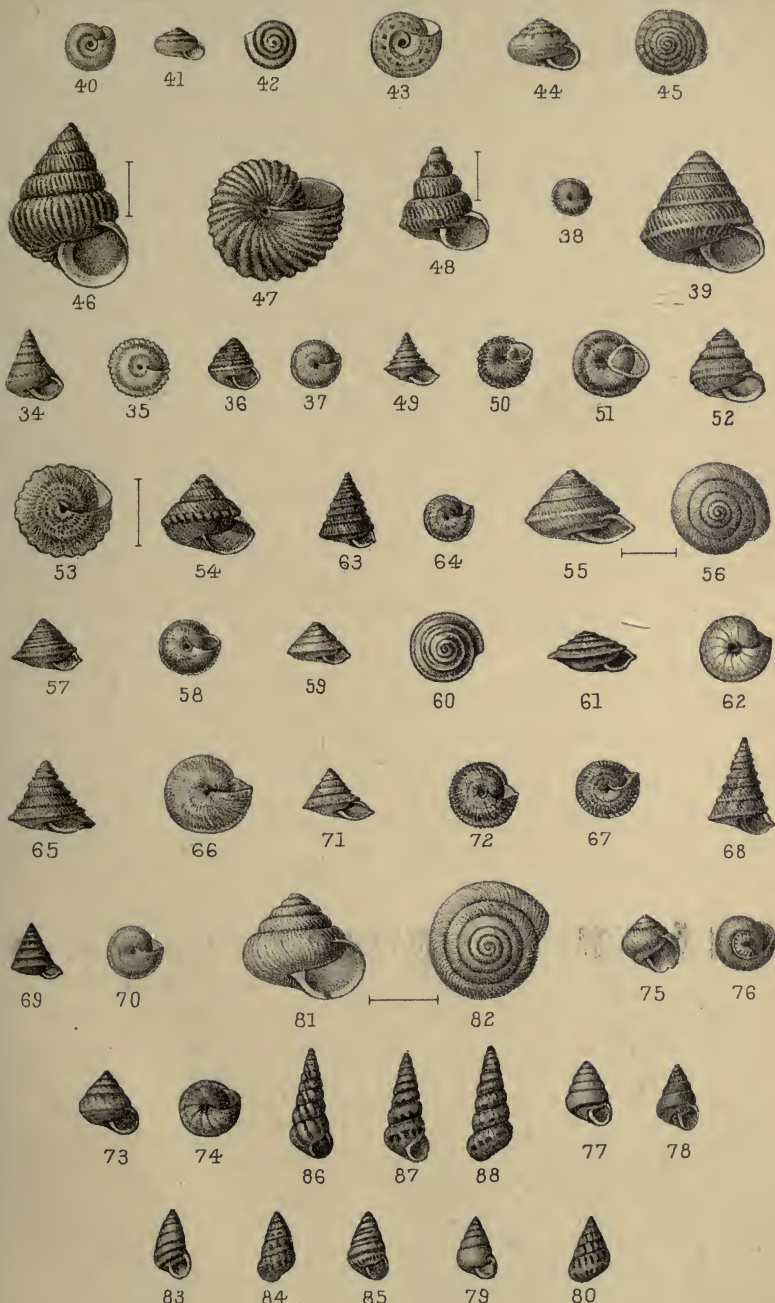
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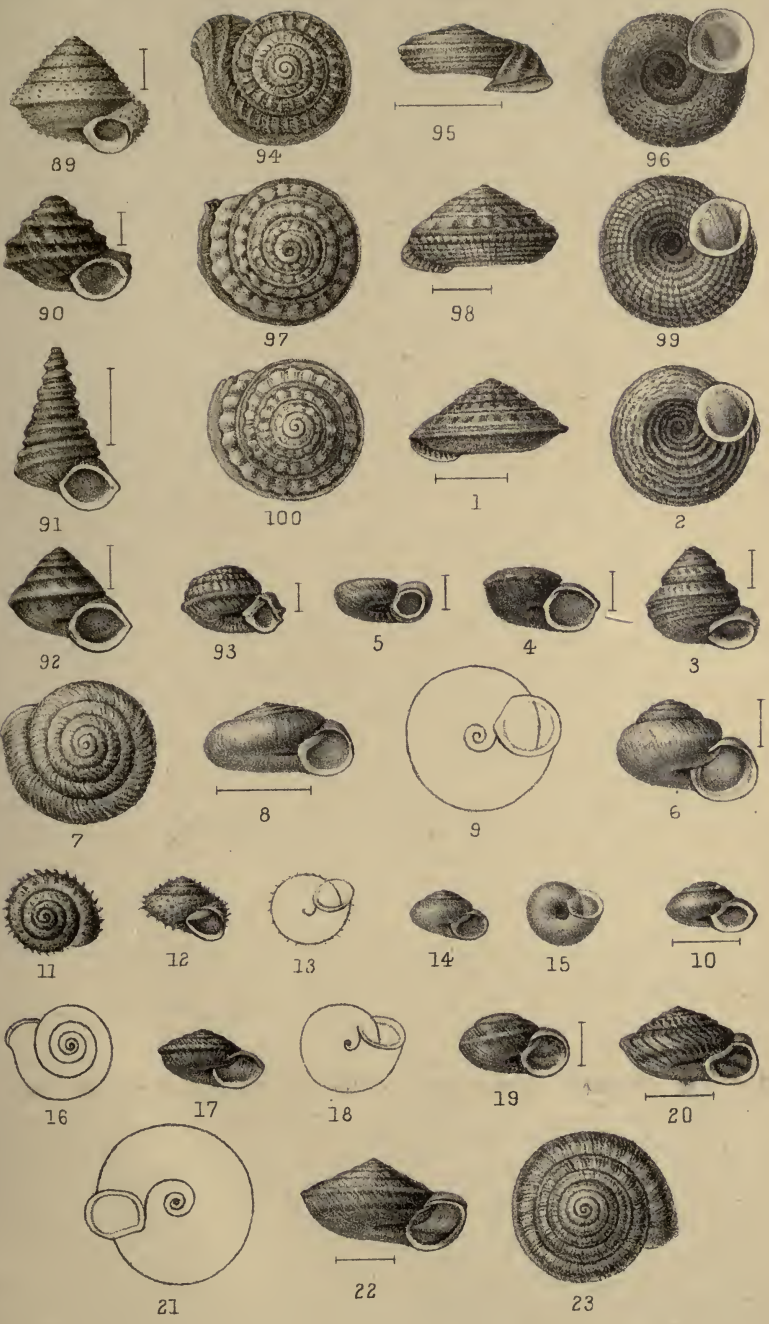
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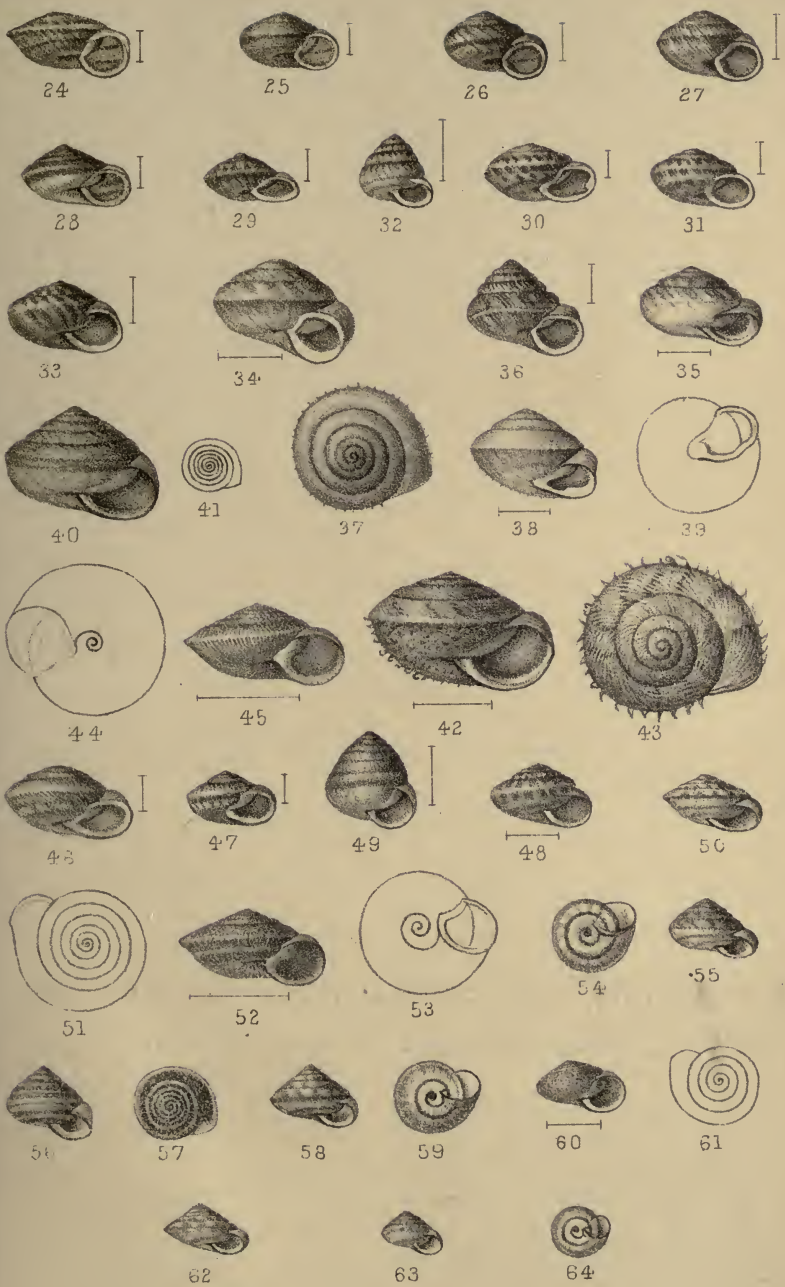
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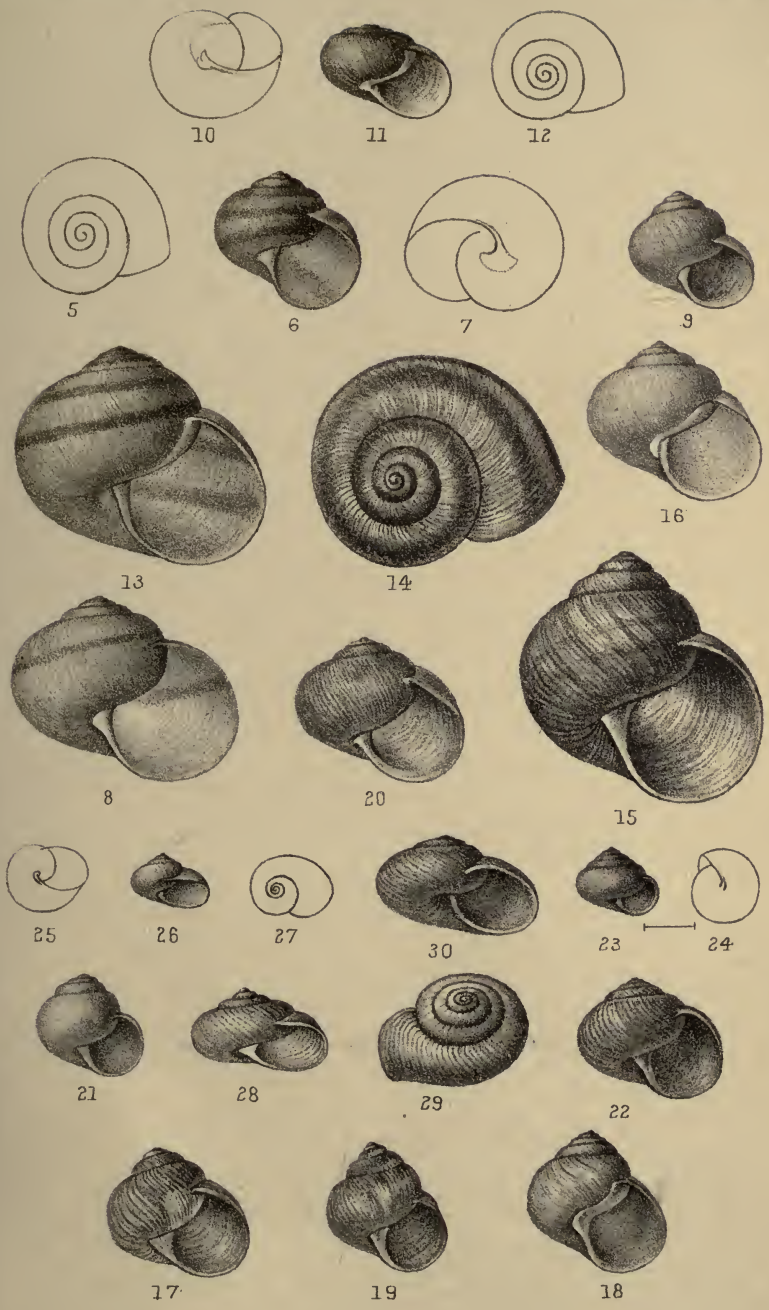
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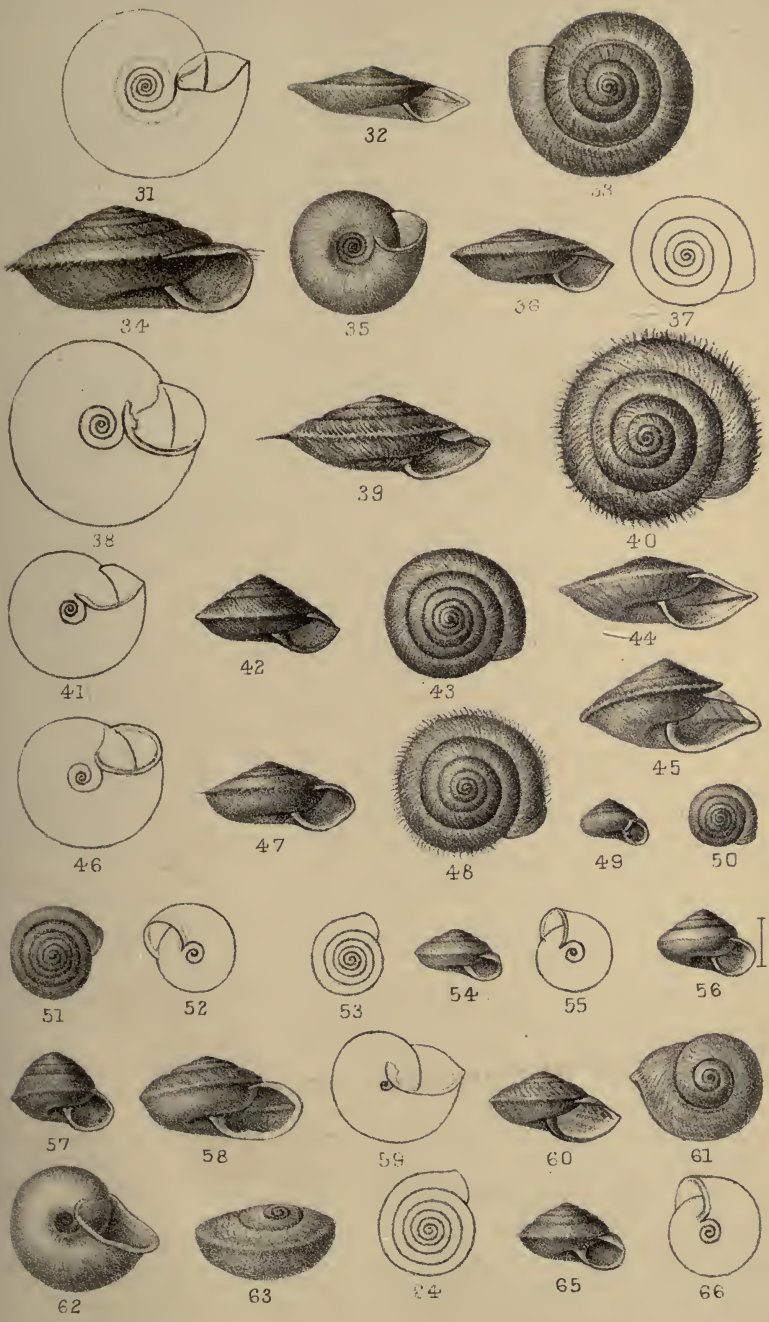
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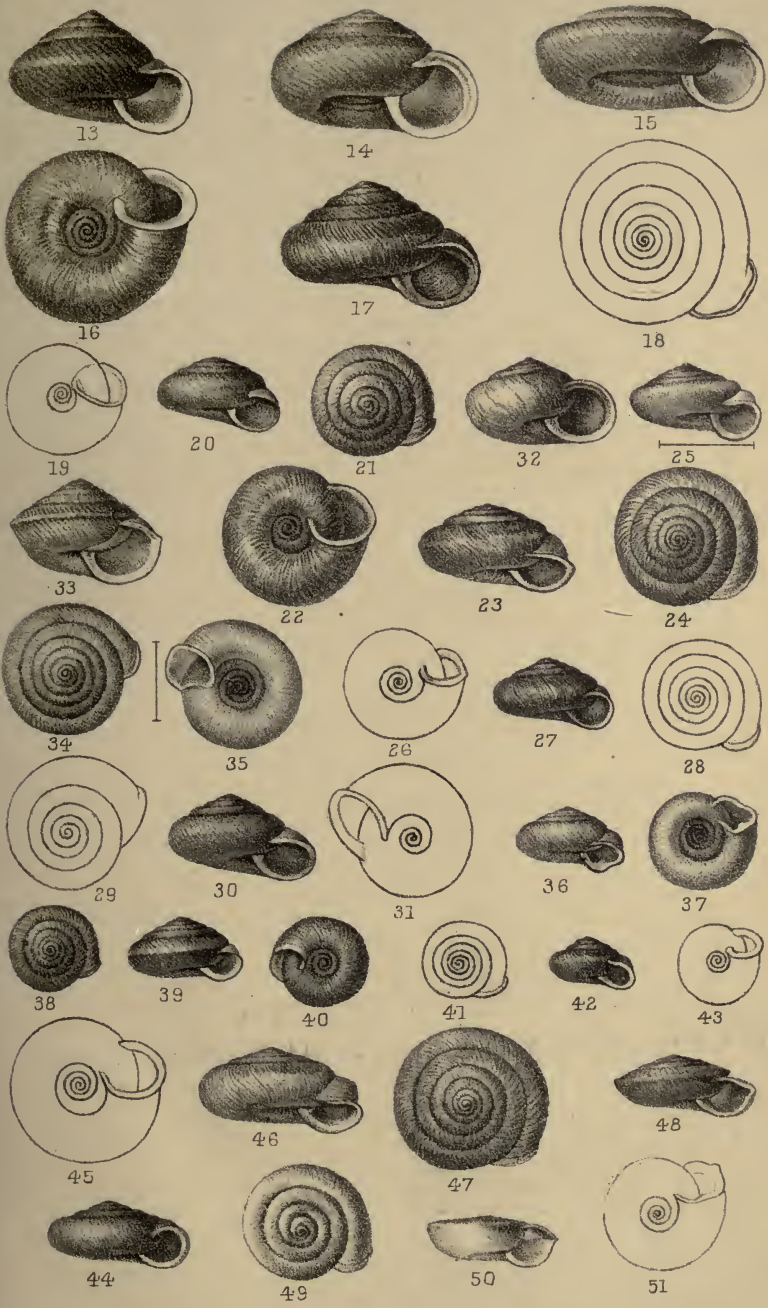
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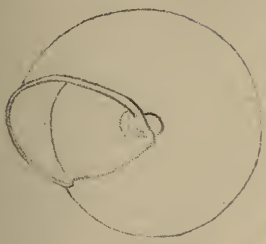
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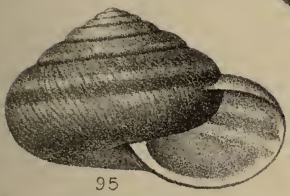
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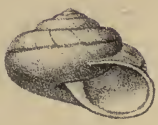
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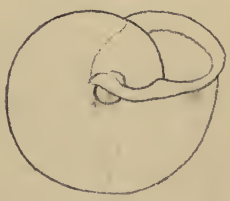
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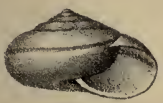
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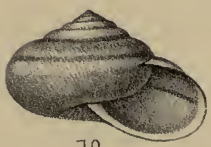
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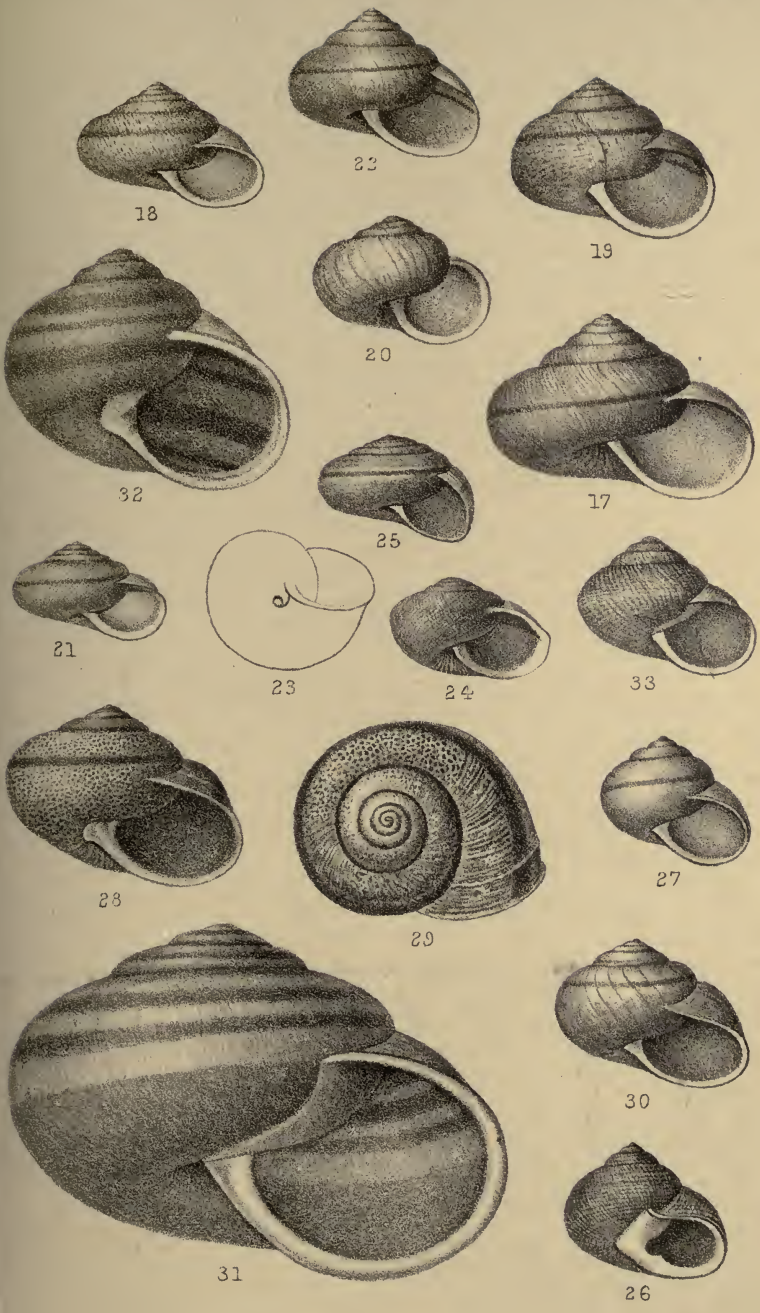
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H. NILAGHERICA, Pfr. Pl. 14, figs. 70, 71.

Very widely umbilicated, striate, corneous white, with a superior chestnut band; whorls 5½, slowly increasing, the last abruptly deflected in front, aperture small, subhorizontal, peristome nearly continuous, white, sublabiate, reflected. Diam. 14·5 mill.

Nilgheri Mts., Eastern India.

H. CYCLOSTOMATA, Guillou. Pl. 14, figs. 63, 64.

Widely umbilicated, pellucid, linearly papillary, light olivaceous, with chestnut lines; whorls 4, convex, with deep suture, peristome nearly continuous, externally constricted, thin, reflected.

Diam. 7–8 mill.

Warrior Isl. Torres Strait, N. Australia.

Is possibly a synonym of *H. Tuckeri*, below.

H. CONTRACTA, Hutton. Pl. 14, figs. 61, 62.

Widely umbilicated, obliquely striulate, smooth, a little shining, whitish, with a superior chestnut band, suture impressed; whorls 4, the last subangulated above, descending in front, convex below; peristome expanded above, reflected below, margins approaching.

Diam. 13 mill.

Malva, India.

H. TUCKERI, Pfr. Pl. 14, fig. 79.

Moderately umbilicated, thin, pellucid, obliquely striate, shortly, sparsely hairy, brownish corneous, obsoletely narrowly brown banded; peristome whitish, shortly reflected, externally constricted.

Diam. 7 mill.

Charles Hardy's Isl. Pacific Ocean.

H. strangulata, Hombr. and Jacq. is a synonym, and *H. cyclosomata*, above described, is possibly another.

H. ALBICOSTIS, Pfr. Unfigured. *Ahmednuggur, India.*

H. SORDIDA, Pfr. Unfigured. *Near Pondicherry, E. India.*

Subsection ANGASELLA, Adams, 1863.

H. CYRTOPLEURA, Pfr. Pl. 14, figs. 85, 86.

Rather widely umbilicated, somewhat solid, with thread-like curved riblets, whitish; whorls 4–4½, scarcely convex above, slightly descending in front, base more convex; aperture shining; peristome thickened, white, shortly expanded, margins converging.

Diam. 18 mill.

 So. Australia.

H. Phillipsiana, Angas. Pl. 14, figs. 87–89.

Widely umbilicated, rather thin, obliquely plicate-striate, and lightly granular, brownish white; whorls 4½, convex, the last rounded, descending in front, subconstricted behind the aperture; peristome almost continuous, expanded and slightly reflected, margins joined by a thick callus. Diam. 13 mill.

Arrowie, So. Australia.

H. Eyrei, Ad. and Angas. Pl. 14, figs. 90, 91.

Widely umbilicated, rather thin, obliquely striate, very minutely granular, light brown, paler below; whorls 5, a little convex, the last rounded and somewhat descending in front; peristome flesh colored, thickened, slightly expanded, margins approaching.

Diam. 17 mill.

Shores of Lake Eyre, Central Australia.

H. Delessertiana, Guillou. Pl. 14, figs. 92, 93, 78.

Moderately umbilicated, thin, obliquely costulate-striate, hyaline brownish white, suture subchanneled; whorls 5½, convex; peristome reflected above. Diam. 16·5 mill.

Warrior Isl. Torres Straits, Australia; New Zealand.

H. Taranaki, Gray (fig. 78) and *H. Torresiana*, Hombr. et Jacq. are synonyms.

H. subsecta, Tate. Pl. 14, figs. 80, 81.

Moderately umbilicated, solid, somewhat rugosely plicate, and closely longitudinally striate, greyish white, epidermis?; whorls 5, the last rounded at the periphery, much depressed in front; peristome thin, acute, reflected, nearly continuous. Diam. 15 mill.

Port Wakefield, So. Australia.

Unfigured Species.

H. Endeavorensis, Brazier. *Endeavor River, N. Australia.*
H. Dryanderensis, Cox. *Port Denison, Queensland, Australia.*

Group IX, ARIONTA, Leach, 1820.

Shell of moderate size, globosely turbinate or depressed, usually with one or three (rarely with two) bands, last whorl declining in front, peristome reflected, thickened, margins approaching.

Section I, Lysinoe, Adams, 1855.

Moderately or narrowly umbilicated, smoothish, epidermis sometimes shortly hairy, globosely turbinate, periphery sometimes subangulate, last whorl descending in front, peristome reflected, margins approaching, impinging on the umbilicus below. *West Coast of North America.* H. FIDELIS, Gray.

Aglaja, Albers, 1860, is a synonym.

Subsection I, HELMINTHOGLYPTA, Ancey, 1887.

Surface vermiculately rugose, H. ARROSA, Gould.

Subsection II, ODONTURA, Crosse and Fischer, 1872.

Subglobose, with narrow umbilicus, granular epidermis in fresh individuals shortly hairy. *Southern Mexico, Guatemala.* H. GHIESBREGHTII, Nyst.

Subsection III, LEPTARIONTA, Crosse and Fischer, 1872.

Smoothish, small, thin, whorls about $4\frac{1}{2}$, last whorl descending in front, with a single brown band, periphery rounded, peristome shortly reflected, umbilicus narrow. *Mexico.* H. FLAVESCENS, Wiegm.

Subsection IV, PRATICOLA, Strebel, 1880.

Orbicular, small, last whorl constricted behind the aperture, peristome shortly reflected, lipped within. *Texas, Eastern Mexico.* H. BERLANDIERIANA, Mor.

This group is *Hygromia* (Risso) in part, of American authors.

Subsection V, MICRARIONTA, Ancey.

Shell thick, small, depressed, peristome shortly reflected, thickened within. *Islands of So. California.* H. FACTA, Newc.

More depressed, and geographically separated from *Praticola*, but very close to it.

Subsection VI, PŒCILOSTOLA, Ancey, 1887.

Imperforate, rather thin, globosely depressed, whorls few, the last large, peristome thickened, white, thinly reflected. *Andes Regions of So. America.* H. FARRISI, Pfr.

Subsection VII, Epiphragmophora, Döring, 1875.

Depressed, smooth, moderately umbilicated, peristome scarcely expanded, strongly labiate within, extremities approaching. Aperture closed in winter by a chalky epiphragm. *So. America.* H. Hieronymi, Döring.

Subsection VIII, Eurycampta, Albers, 1860.

Moderately large, narrowly umbilicated, roughly ribbed, usually brownish, with a single band, turbinate, whorls slopingly flattened above, more convex below, peristome reflected, extremities approaching, without callus connection. *West Indian* (mostly *Cuban*). H. Bonplandii, Lam.

Section II, Campylæa, Beck, 1837.

Shell moderately umbilicated, orbicularly depressed, planospiral, more or less solid, glabrous or hirsute; whorls 4½–6, the last deflected near the aperture; aperture oval or sub-circular, peristome expanded reflected, more or less thickened, its extremities approaching and joined by a parietal callus, columellar lip dilated, reflected, very rarely touching the umbilicus.

European; *mostly Mediterranean countries.*

Subsection I. Xerocampylæa, Kobelt, 1871.

Depressed, very narrowly umbilicated; peristome acute, very thinly labiate within, margins approaching.

This group connects with *Xerophila*, and is therefore not typical although Pfeiffer gives it first place under *Campylæa.*

H. Carascalensis, Fér.

Subsection II. Fruticocampylæa, Kobelt. 1871.

Small, flat or flatly bullet shaped species, inhabiting Circassia and Armenia.

H. Ravergiensis, Fér. *Caucasus.*

Subsection III. Eucampylæa, Pfr. 1881.

Typical group of Campylæa. *Southern Europe.*

H. cingulata, Studer.

Cingulifera, Held., 1837, *Corneola*, Held. 1837 and *Chilostoma*, Moquin-Tandon, 1855, are synonyms.

Subsection IV. Tacheocampylæa, Pfeiffer. 1877.

A Corsican group including large, banded species.

H. Raspailii, Payr. *Corsica.*

Subsection V. PSEUDOCAMPYLÆA, Hesse. 1884.

A Grecian group, including species with sub-continuous peristome.

H. PELLITA, Fér. *Grecian Archipelago.*

Subsection VI. ELONA, H. and A. Adams, 1855.

Shell planorboid, spire involute, apex immersed, H. QUIMPERIANA, Fér. *Sterna*, Albers. 1850 (non Linn.), is a synonym.

Subsection VII. CHILOTREMA, Leach. 1820.

Lenticular, strongly carinated, aperture basal, sub-horizontal, transversely oval, the reflected lip continuous, angular.

H. LAPICIDA, Linn.

Helicogona, Risso. 1826, *Latomus*, Fitz. 1833, *Lenticula*, Held. 1837, and *Vortex*, Moquin-Tandon. 1855, are synonyms.

Section III. ARIONTA, Leach. 1820.

Shell perforate, rather thin, turbinately globose; whorls 6, convex, peristome lipped, columellar lip dilated near the umbilicus.

H. ARBUSTORUM, Linn.

Europe, California. Different as are these habitats the mollusks and shells appear to be intimately related: they are geographically isolated, the whole of the United States east of the Rocky Mountains possessing no representative of the group.

Section IV. EURYSTOMA, Albers, 1850.

Narrowly umbilicated, globosely depressed, calcareous; whorls 5, the last deflected near the aperture, convex below; peristome widely lipped, its extremities approximating, joined by a callus. H. VITTATA, Müll. *Ceylon.*

Eyrystoma, Mörch. 1852, is a synonym.

Group IX, ARIONTA, Leach, 1820.

Section I. LYSINOE, Adams, 1855.

H. FIDELIS, Gray. Pl. 15, figs. 94–96.

Moderately umbilicated, rugosely striated with impressed spiral lines, light yellowish or brownish above, lower surface dark chestnut, sometimes uniformly black, with a peripheral chestnut band; whorls 7, rounded; periphery thickened, simple above, reflected below.

Diam. 34 mill.

Northern California, Oregon, Washington Terr.

H. Nuttalliana, Lea is a synonym.

H. INFUMATA, Gould. Pl. 15, fig. 97.

Moderately umbilicated, with minute rasp-like elevations, running obliquely to the growth-striæ and in the fresh state bearing very short soft hairs, smoky brown above, blackish, shining and minutely granulated on the base; whorls 6½, flatly convex, the periphery acutely angulated; peristome somewhat reddish, simple above, reflected at the base. Diam. 37 mill.

Northern California, near the coast.

Young specimens are sometimes banded. The animal is black, with bright red tubercles.

H. HILLEBRANDI, Newcomb. Pl. 15, fig. 98.

Moderately umbilicated, finely striated, granular, and hirsute in fresh specimens, yellowish horn color with a chestnut band bordered with white on either margin; whorls 6, slightly convex, the last with carinated periphery, slightly descending in front; peristome white, subreflected, extremities approaching. Diam. 1 in.

Sierra Nevada region, California.

H. AYRESIANA, Newcomb. Pl. 15, fig. 99.

Rather narrowly umbilicated, with rough oblique incremental striæ, deeply cut by impressed revolving lines, yellowish white, with a narrow superior chestnut band; whorls 7, convex, the last descending in front, subglobose; peristome simple. Diam. 22 mill.

Sta. Cruz, S. Miguel and Sta. Rosa Islands of California.

Erroneously described as from Northern Oregon.

H. MORMONUM, Pfr. Pl. 15, fig. 1.

Moderately umbilicated, rather thin, with curved incremental striæ, light chestnut color, with a chestnut band edged with white on either side; whorls 6, convex, slowly enlarging; aperture very oblique, peristome thickened, white, a little expanded, extremities slightly converging. Diam. 29 mill.

Between Sierra Nevada and Coast Range, California,

Not a coast or Oregonian species, as at first supposed.

H. CIRCUMCARINATA, Stearns. Pl. 15, figs. 2–4.

Rather widely umbilicated, finely granulated, with irregular ribs intermingled with the growth striæ, yellowish white, sometimes with a superior double band, the upper striæ being whitish, the lower chestnut color; whorls 6–6½, the last with a compressed, fimbriated

keel, which also forms a sutural margin above; peristome moderately thickened, subreflected, the extremities connected by a thin parietal callus. Diam. 22–25 mill.

Columbia, Toulumne Co., California.

Described as a variety of *H. Mormonum*, Pfr. I regard it as distinct.

H. Traskii, Newcomb. Pl. 15, fig. 5.

Narrowly umbilicated, thin, translucent, dark horn colored, with a superior narrow chestnut band, edged on both sides with white, delicately obliquely striate, with microscopic crowded spiral lines; whorls 6, slightly convex, gradually increasing, the last somewhat plane above; peristome thickened, white. Diam. 21 mill.

Coast region of Southern California.

H. Carpenteri, Newcomb. Pl. 15, figs. 6–8.

Moderately umbilicated, rather thin, striate, crossed by microscopic spiral lines, whitish, with a narrow, superior chestnut band; whorls 5½, convex, the last descending in front; peristome a little expanded, the extremities approaching. Diam. 23 mill.

Cinaloa, Mexico, Lower California, Southern California.

H. Remondi, Tryon is a synonym. The species is closely allied to, perhaps a synonym of *H. Traskii*, Newcomb.

H. Dupetithouarsi, Deshayes. Pl. 15, fig. 9.

Moderately umbilicated, polished, smooth, subpitted or substriate, dark chestnut below, lighter above, with a chestnut, white bordered band, or sometimes two; whorls 7–8, convex, the last inflated; aperture white and banded within, peristome simple, reflected below. Diam. 30 mill.

Monterey, California.

H. Oregonensis, Lea is a synonym.

H. sequoicola, Cooper. Pl. 15, fig. 10.

Moderately umbilicated, rather thick, with somewhat rugose growth striæ, often decussated by coarse incised lines, upper whorls with crowded granulations, and probably hirsute in fresh specimens, light chestnut color, paler below, with a narrow superior chestnut band, bordered with white on either margin; peristome white, thickened, extremities approaching. Diam. 23–27 mill.

Near Sta. Cruz, California.

A coast species, allied to *H. Mormonum* but distinguished by its sculpture.

H. RUFOCINCTA, Newcomb. Pl. 15, fig. 11.

Narrowly umbilicated, rather thin, scarcely marked by growth lines, and occasional revolving lines, horn color, with a narrow, white-margined chestnut band; whorls 5–6, flatly convex above, the last descending in front, convex on the base; peristome white, thickened, reflected below. Diam. 17 mill.

Catalina Island, California.

H. ROWELLII, Newcomb. Pl. 15, figs. 12, 13.

Moderately umbilicated, smooth, very slightly obliquely striulate, and very minutely punctulate, somewhat shining, whitish, with a single narrow chestnut band; whorls 4½, somewhat convex, the last descending in front and swollen, base subplanate; aperture widely circular, peristome white, expanded, extremities approaching and joined by a callus. Diam. 20 mill.

Lower California.

H. Lohrii, Gabb, (fig. 13) is a synonym.

H. SERIATISETA, Rochebrune. *Unfigured.* *Cochin China.*

Referred to by its author to this group, of which it can scarcely be a member.

Subsection I, HELMINTHOGLYPTA, Ancey, 1887.

H. ARROSA, Gould. Pl. 16, fig. 17.

Moderately umbilicated, rather solid, rugulosely malleated and minutely granulated, reddish olive, or yellowish, with a superior, narrow, dark chestnut band; whorls 7, convex, the last a little descending in front; aperture bluish, with pellucid band; peristome flesh colored, shortly expanded, the base reflected.

Diam. 34–40 mill.

Coast of California from Sta. Cruz to Mendocino Co.

Dr. Cooper has named two varieties *Holderiana* and *Stiversiana;* the varietal characters appear to be unimportant. Mr. Binney also mentions an albino specimen. *H. æruginosa*, Gould (not Pfr.) is a synonym.

H. TOWNSENDIANA, Lea. Pl. 15, figs. 14–16.

Rather narrowly umbilicated, yellowish and brownish horn color intermixed, with faintly impressed, minute longitudinal striæ and coarse oblique, malleated wrinkles; whorls 6, flatly convex, the last

well-rounded, descending in front; peristome white a little expanded at the top, becoming reflected on the base. Diam. 29 mill.

Oregon, Mountains of Idaho and Montana.

H. pedestris and *H. ruida* of Gould are synonyms. *H. ptychophora*, Brown, was formerly considered a small variety of this species; it is now referred to Mesodon (Vol. III, p. 154).

H. EXARATA, Pfr. Pl. 16, fig. 18.

Moderately umbilicated, rather solid, rugulosely malleated, yellowish brown, with a narrow superior chestnut band; whorls 7, convex, the last scarcely descending in front; peristome slightly white-lipped, expanded. Diam. 30 mill.

Coast region of California, from S. Francisco to Sta. Cruz.

H. NICKLINIANA, Lea. Pl. 16, figs. 19, 20.

Minutely umbilicated, rather thin, with light growth-lines, faintly indented and granulated in quincunx order, pale horn colored or ash-yellow, with a superior chestnut narrow band, paler on its margins; whorls 6, moderately convex, the last ventricose, the periphery sometimes obsoletely angulated, base tumid; peristome white, slightly reflected above, more so below. Diam. 28 mill.

California to Santa Cruz to Mendocino Co.

H. nemorivaga and *H. arboretorum*, Val. are synonyms. *H. anachoreta*, Binney (fig. 20) was founded on a less globose form of this species, without revolving band. In his latest monograph Mr, W. G. Binney considers *H. Nickliniana* a variety of *H. Californiensis*, Lea, a decision with which I by no means agree. I do not think *H. Californiensis* belongs to this group at all.

H. RAMENTOSA, Gould. Pl. 16, fig. 21.

Narrowly umbilicated, rather solid, obliquely striated and granulated, yellowish brown with a superior narrow chestnut band; whorls 5½, somewhat convex, the last broad, rounded or very obsoletely angulated, not declining in front; peristome white, thickened, somewhat expanded, reflected at the base. Diam. 20 to 30 mill.

Napa Co. to Sta. Clara Co., California.

The synonyms are *H. reticulata*, Pfr. and *H. Bridgesii*, Newcomb. The latter name being preoccupied, I formerly suggested instead of it *H. Parkeri*. Mr. Binney considers *H. ramentosa* a variety of *H. Californiensis*, Lea.

H. DIABLOENSIS, Cooper. Pl. 16, fig. 25.

Narrowly umbilicated, thin, roughened with incremental wrinkles and with regular malleations arranged in spiral series, reddish horn color, with a narrow, superior chestnut band, white-margined on either side; whorls 6, convex, the last not descending, somewhat compressed on the side; peristome thickened, white, almost simple. Diam. 22 mill.

Mt. Diablo near S. Francisco, and in Colusa and Napa Co's. Cal.

A species of the Coast Range. Mr. Binney makes this also a variety of *H. Californiensis*, Lea.

H. INTERCISA, W. G. Binney. Pl. 16, figs. 26, 33, 27.

Imperforate, thick, growth lines numerous and distinct, crossed by close, regular spiral lines, so deeply impressed that the surface is divided into minute raised parallelograms, greyish yellow, with an obsolete band; whorls 5, slightly rounded, the last descending in front; aperture very oblique, horse-shoe shaped, peristome dirty white, thickened, spread at the umbilicus, which it covers, often with a basal tooth-like process near the columella; margins of peristome connected by a parietal callus. Diam. 22 mill.

S. Clemente and Sta. Cruz Is., Cal.

The above is the adult condition: a lighter type but connected with it is the form described by Dr. Newcomb as *H. crebristriata* (fig. 33). In an apparently semi-fossil condition the thickening of the shell is carried still further than in recent specimens.

Var. REDIMITA, W. G. Binney. Fig. 27.

Imperforate, thin, wrinkled, covered with minute crowded granulations; whorls 6, rounded, the last descending in front, reddish brown, with a chestnut band; periphery simple, light-chestnut colored, thickened, extremities approaching. Diam. 21 mill.

S. Clemente Is., Cal.

It is *H. Nickliniana*, A. Binney in part.

H. TUDICULATA, Binney. Pl. 16, figs 28–30.

Imperforate, or subumbilicated, olivaceous brown, with a chestnut, white-margined band, visible above the suture on the spire, obliquely striate and malleately punctate; whorls 5½, slightly convex, body whorl large, tumidly expanding in front; peristome whitish, thin, expanded, slightly reflected below. Diam. 33 mill.

Coast and Sierra Nevada region of California.

Var. CYPREOPHILA, Newcomb. Fig. 30.

Shell thinner, scarcely malleated, umbilicus narrowly open.

Copperopolis and San Diego, Cal.

Subsection II, ODONTURA, Crosse and Fischer, 1872.

H. GHIESBREGHTI, Nyst. Pl. 16, fig. 31.

Narrowly umbilicated, striate, pilose when fresh, chestnut color, with yellowish bands on the upper part of the shell, the intervening surface sometimes darker chestnut or nearly black; whorls 5½, somewhat convex, the last large, rounded, slightly descending in front; lip white, expanded, shortly reflected, margins approaching.

Diam. 50–65 mill.

Chiapa, Mexico; Vera Paz, Guatemala.

There is some variation in the ground color, and number and disposition of the bands: in one variety the shell is yellowish with a narrow chestnut band above, and another and wider one below the periphery.

H. EXIMIA, Pfr. Pl. 16, fig. 32.

Scarcely umbilicated, obliquely rugose and very closely granular, corneous olivaceous, with five or six dark brown bands; whorls 4½, somewhat convex, rapidly increasing, the last inflated, descending in front, compressly inflated round the brownish umbilical region; peristome simple, whitish, narrowly reflected, dilated over the umbilicus, which it nearly closes. Diam. 37–41 mill.

Guatemala, Honduras.

Subsection III, LEPTARIONTA, Crosse and Fischer, 1872.

H. FLAVESCENS, Wiegm. Pl. 19, figs. 76, 77.

Perforate, thin, smooth, opaque, light yellowish, variegated with pellucid strigations and spiral lines and a chestnut band, suture subplicate; whorls 4½, scarcely convex, the last descending and subconstricted in front; lip white, shortly expanded, columellar margin nearly closing the umbilicus. Diam. 12 mill.

Near Papantla, Mexico.

H. BICINCTA, Pfr. Pl. 19, fig. 78.

Narrowly umbilicated, thin, glabrous, pellucid, light greyish yellow, with two narrow spiral bands, the upper one chestnut color, the lower one milk white, suture white-margined; whorls 4½, somewhat

flattened, the last with a black band surrounding the peristome; peristome patulous, acute, subreflected. Diam. 20 mill.

Oajaca, Mexico.

H. Verrilli, Ancey. *Unfigured.* *Durango, N. W. Mexico.*

Subsection IV, Praticola, Strebel, 1880.

H. Ocampi, Strebel. Pl. 19, figs. 79, 80.

Perforate, rather solid, slightly translucent, dull yellowish horn color, or reddish brown with yellowish suture, finely irregularly striate, with microscopic spiral lines; whorls 5½, somewhat convex, the last inflated, descending in front, constricted behind the aperture; peristome shortly reflected, white. Diam. 12 mill.

Mirador, Mexico.

H. ampla, Pfr. an unfigured species is possibly identical: if so, it should take priority.

H. Berlandieriana, Moric. Pl. 19, figs. 81–83.

Narrowly umbilicated, rather thin, somewhat translucent, subopaline, scarcely striate, light ashy white or yellowish white, or greenish yellow, sometimes with a single chestnut band, suture deep; whorls 4½–5, rather convex, the last scarcely descending in front, rounded, base subinflated, constricted behind the aperture; peristome white, labiate within, reflected. Diam. 12 mill.

Prov. Tamaulipas, Mexico, Texas, Arkansas.

H. pachyloma, Menke and *H. virginalis*, Pfr. are synonyms.

H. griseola, Pfr. Pl. 19, figs. 84–86.

Narrowly umbilicated, thin, subtranslucent, a little shining, obliquely striate, greyish, with a light fulvous, white-margined band, suture impressed; whorls 4–4½, scarcely convex, not descending in front, base subinflated; aperture showing the exterior band, peristome simple, slightly reflected, white, margins distant.

Diam. 9·5 mill.

Near Vera Cruz, Mexico, Texas, Nicaragua.

Var. β. More elevated, light corneous, with a single white margined band. Diam. 10 mill.

The synonymy includes *H. cicercula*, Fér., *H. splendidula*, Anton, and *H. albozonata*, and *H. albocincta*, Binney.

H. LEUCORHAPHE, Pfr. Pl. 19, fig. 87.

Narrowly umbilicated, very lightly striulate, diaphanous, yellowish corneous, with a narrow chalky band at the impressed suture; whorls 6, a little flattened, the last more convex, not descending, base subplanate; peristome simple, acute. Diam. 10 mill.

Island of Hayti.

H. TRYPANOMPHALA, Pfr. *Unfigured.* *Sierra Maestra, Mexico.*

H. SALVINI, Tristram. *Vera Paz, Guatemala.*

Subsection V, MICRARIONTA, Ancey.

H. GABBII, Newcomb. Pl. 19, fig. 88.

Umbilicus almost covered, shell thin, light corneous, with a narrow brown band; whorls 5, convex, with well impressed suture, last whorl descending in front; lip white, reflected, not callous. Diam. 10 mill.

San Clemente Isl., S. California.

Var. FACTA, Newcomb. Pl. 19, fig. 89.

Almost covered rimate, solid, compact, glabrous, whitish, with a chestnut band; whorls 5–5½, slightly convex, the last descending in front; suture moderately impressed; peristome yellowish, thick, reflected. Diam. 10·5 mill.

Ins. Sta. Barbara and San Nicolas, S. California.

Subsection VI, PŒCILOSTOLA, Ancey, 1887.

[The name of this section is preoccupied. Ed.]

H. FARRISI, Pfr. Pl. 18, figs. 69, 70.

Imperforate, rather thin, spirally striate and reticulated with impressed pits, fulvous, with four brown bands, and maculated with yellowish strigations; whorls about 4½, rapidly increasing, the last ventricose, deflected in front; peristome white lipped, the margin expanded. Diam. 35 mill.

Mountains of Peru.

H. TSCHUDIANA, Phil. Pl. 17, figs. 41–43.

Umbilicus covered, rather solid, striulate, and decussated by very thin spiral lines, fulvous, with a single, narrow chestnut band; whorls 4½, the last deflected in front; peristome thickened, white, widely reflected, parietal wall with a thin callus. Diam. 29 mill.

Huancavelica, Peru.

H. CLAUSOMPHALOS, Deville and Hupé. Pl. 18, figs. 67, 68.

Imperforate, depressed, whitish to chestnut color, with a single, narrow chestnut band visible on the spire-whorls, last whorl wide, deflected anteriorly, periphery obtusely subangulated; peristome thick, reflected, expanded over the umbilicus. Diam. 29 mill.

Huancavelica, Andes of Peru.

H. ALSOPHILA, Philippi. Pl. 17, figs. 48–50.

Imperforate, somewhat solid, striulate, slightly transversely malleated, shining, fulvous brown, with a chestnut band, light bordered below; peristome white, thickened, expanded. Diam. 30 mill.

Mts. of Sta. Ana, Peru.

H. ESTELLA, Orb. Pl. 18, fig. 71.

Imperforate or perforate, thin, diaphanous, irregularly submalleately reticulated, striated or nearly smooth, yellowish brown or whitish, with a narrow superior chestnut band; whorls 4, convex, the last deflected in front; peristome reflected, white, columellar margin dilated and appressed above. Diam. 23–38 mill.

Valle grande, Bolivia.

Var. TUCUMANENSIS, Döring.

Costulate-striate, nearly imperforate, submalleately reticulated in front, convex below and lighter colored; whorls 4½.

Diam. 32–34 mill.

Sierra de Tucuman.

Subsection VII, EPIPHRAGMOPHORA. Döring, 1875.

H. CUYANA, Strobel. Pl. 19, figs. 73–75.

Narrowly umbilicated, lenticular, carinated, rather thin, obliquely plicate, suture submargined; whorls 4, flattened, rapidly increasing, the last not descending, periphery acutely crenately carinated, base convex, arcuately plicate; aperture brownish, shining, peristome simple, basally shortly reflected, columellar margin dilated above.

Diam. 14·5 mill.

Prov. Mendoza, Buenos Ayres.

H. HIERONYMI, Döring.

Widely umbilicated, subcalcareous, a little shining, usually with a light chestnut band, depressed, slightly convex, suture deep; whorls 4½–5, convex, the last slightly descending in front; peristome sub-

simple, acute, expanded, slightly white-lipped within, margins approximating. Diam. 18–20 mill., alt. 8 mill.

Catamarca, Argentine Republic.

This species was figured in Jahrb. Mal. Gesell. 143, Pl. 6, fig. 4 1878, but in the copy to which I have access this plate is missing, so that I am unable to figure it.

H. Higginsi, Pfr. Pl. 17, fig. 34.

Umbilicated, rather solid, striated and malleated, olivaceous brown, with a single chestnut band, suture impressed; whorls 4½, slightly convex, the last descending in front, with convex base; peristome white, shortly reflected, the columellar margin impinging on the umbilicus. Diam. 32 mill.

Huamachuco, Peru.

This is *H. Farrisi*, Higgins, not Pfeiffer.

H. Jaspidea, Pfr. Pl. 17, figs. 35–37.

Widely umbilicated, rather solid, obliquely costulate-striate, corneous white, flamed and sub-banded with light corneous, suture smooth, margined; whorls 5, somewhat flattened, regularly increasing, the last descending in front, periphery angulated, base convex; aperture white banded, peristome whitish, margins approximating, simple above, reflected at the base. Diam. 31 mill.

Prov. Patas, Peru.

H. Costaricensis, Roth. Pl. 17, figs. 38–40.

Widely umbilicated, rather solid. smoothly striated and spirally subsulcated, purplish flesh color, with four narrow bands; whorls 4½, obliquely flattened above, the last more convex near the suture, obtusely angulated at the periphery, the angle whitish, dark margined, base whitish, umbilicus chestnut colored; peristome expanded and slightly reflected. Diam. 30 mill.

Costa Rica.

H. Huanucensis, Phil. Pl. 17, figs. 44–46.

Moderately umbilicated, smooth, striulate, yellowish, usually one or two banded with chestnut above; whorls 5, planulate, the last deflected in front, periphery with a rounded carina; peristome slightly thickened, expanded above, reflected below, extremities joined by a parietal callus. Diam. 24 mill.

Huanuco viejo, Peru.

H. SARGI, Crosse and Fischer. Pl. 17, figs. 51–53.

Rather widely umbilicated, moderately thick, subobliquely, obsoletely striulate, chestnut brown, without band, suture somewhat deeply impressed; whorls 5, slowly increasing, the last descending in front, periphery obtusely angulated, base flattened, paler, olivaceous brown; aperture and periphery white, the latter reflected, margins approaching. Diam. 27·5 mill.

Tamaja, Guatemala.

H. DILUTA, Pfr. Pl. 17, fig. 47.

Narrowly umbilicated, thin, pellucid, yellowish corneous, with three brown bands, the upper and lower ones wider and paler; whorls 4, somewhat flattened; periphery simple, flesh-color columellar margin expanded. Diam. 22 mill.

Cuzco, Peru.

H. TRIGRAMMEPHORA, Orb. Pl. 18, fig. 54.

Moderately umbilicated, striulate, shining, yellowish white, with three narrow chestnut bands; whorls 5, slightly convex, the last descending in front; aperture rounded-lunar, peristome white, expanded above, reflected below. Diam. 25 mill.

Valle grande, Bolivia.

H. PELLIS-COLUBRI, Phil. Pl. 19, fig. 72.

Widely umbilicated, striulate, slightly malleated below; yellowish white, with a single chestnut band; whorls 5½, slightly convex, last whorl subcylindrical, a little descending in front; peristome thickened, white, widely reflected. Diam. 35 mill.

Otusco, Peru.

H. SEMICLAUSA, Martens. Pl. 18, figs. 65, 66.

Narrowly umbilicated, striulate, and slightly, minutely granular, reddish brown, with a single brown band; whorls 4, rapidly increasing, last whorl scarcely descending in front; peristome reflected, flesh color, columellar margin a little dilated, nearly covering the umbilicus. Diam. 37 mill.

Rödersberg, Brazil.

H. CLAROMPHALOS, Deville et Hupé. Pl. 18, figs. 55, 56.

Rather widely umbilicated, ashy fulvous, unicolored or with one two or three superior brown bands; lip thickened, reflected. Diam. 30 mill.

Near Cuzco, Peru.

Var. MESOMPHALOS, Morelet.

Smaller, more depressed, umbilicus wider, last whorl subangulated.

H. YOCOTULANA, Döring.

Moderately umbilicated, somewhat solid, depressed, smoothish and a little shining, minutely striate, chalky white or yellowish, with a single chestnut band; spire flattened, scarcely elevated, suture deep; whorls 4½, a little depressed, earlier ones whitish or yellowish brown, the last somewhat descending in front, pellucid chalky below; aperture rounded lunate, peristome expanded-reflected, lipped, thickened, dilated and shortly subangularly reflected on the columellar margin.

Diam. 20–22 mill., alt. 9–10 mill.

Yocotula, Argentine Republic.

In our copy of the "Boletin" containing the above description the figure referred to is missing.

H. AUDOUINI, d'Orb. Pl. 18, fig. 64.

Rather widely umbilicated, somewhat solid, rugosely subreticulated, brownish violaceous, variegated with whitish lines, and with three dark bands; whorls 6, the last depressed, descending in front; peristome white, thickened, widely expanded, the margins approaching, and joined by a parietal callus. Diam. 59 mill.

Bolivia.

Var. ORESIGENA, d'Orb.

Shell smaller, with a slightly more elevated spire.

Diam. 37 mill.

H. PATASENSIS, Pfr. Pl. 18, figs. 61–63.

Widely umbilicated, rather solid, striulate and minutely pitted, fulvous, with a single, narrow, superior chestnut band; whorls 5½, slightly convex, the last depressed rounded, deflected in front; peristome whitish, the margins approaching, shortly expanded above, reflected below. Diam. 36 mill.

Andes Mts., Prov. of Patas, Peru.

Var. *minor*, has the chestnut band pale-margined.

H. MACASI, Higgins. Pl. 18, figs. 57, 58.

Widely umbilicated, rather solid, lightly, obliquely plicate-striate, and very minutely concentrically striulate, whitish, with three chestnut bands; whorls 5, somewhat convex, the last deflected in front, base convex; peristome reflected, the margins approaching, joined by a thin callus. Diam. 35 mill.

Macas, Equador.

H. TRENQUELLEONIS, Grat. Pl. 18, fig. 59.

Narrowly umbilicated, rather thin, subpellucid, slightly shining, obsoletely opaquely plicate above, decussated by spiral striæ, smooth below, olivaceous brown, with a single, superior, chestnut band; whorls 4½, rather flat, rapidly increasing, the last depressed, deflected in front, base a little more convex; peristome shortly expanded, red-lipped within, margins approaching, joined by a thin callus.

Diam. 26 mill.

Cordova, Argentine Republic.

Unfigured Species.

H. HIDALGONIS, Döring. *Argentine Republic.*

H. MONOGRAPHA, Burmeister. *Argentine Republic.*

Both the above species have been figured, but the figures are wanting in the Philadelphia Academy's copies of the works which should contain them.

H. GUEINZII, Pfr. *Moyobamba, Peru.*

Subsection VIII, EURYCAMPTA, Albers, 1860.

H. BONPLANDI, Lam. Pl. 19, fig. 95.

Narrowly umbilicated, chestnut color, obsoletely doubly banded with chocolate, subdecussated by very thin incremental and spiral striæ; whorls 4½–5, somewhat convex; aperture brownish violaceous, peristome simple, right margin patulous, the basal somewhat thickened, the columellar reflected. Diam. 29–35 mill.

Cuba.

H. SUPERTEXTA, Pfr. Pl. 19, fig. 94.

Narrowly umbilicated, somewhat solid, subdecussated by incremental striæ and impressed concentric lines, brownish fulvous, with a median chestnut band, suture deep, crenulated, epidermis radiately hydrophanous; whorls 5, convex; aperture brownish, peristome white, expanded above, thickened and reflected below. Diam. 24 mill.

Near Matanzas, Cuba.

Like *H. Bonplandi*, but smaller with more convex whorls, more slowly increasing, with different epidermis.

H. ARCTISTRIA, Pfr. Pl 19, figs. 96, 97.

Very narrowly umbilicated, rather solid, closely, obliquely costulate-striate, light brownish, with two dark bands, and numerous

white epidermal bands; whorls 4½, rather convex, the last depressly rounded, strongly descending in front; peristome fleshy white, margins converging, expanded above, reflected below. Diam. 28 mill.

Ensenada de Corrientes, Cuba.

H. Poeyi, Petit. Pl. 19, fig. 93.

Narrowly umbilicated, thin, closely costulately striate, epidermis deciduous subvelvety; whorls 5, rather flattened, the last carinated, deflected in front; peristome simple, expanded above, reflected below, columellar margin dilated, short subvertical.

Diam. 26 mill.

Cuba.

H. staminea, Menke, and *H. velutinata*, Beck are synonyms.

H. Bryanti, Pfr. Pl. 19, figs. 91, 92.

Narrowly umbilicated, somewhat thin, closely obliquely costulate, light corneous; whorls 4½, somewhat flat, the last more convex, with an interrupted chestnut line at the subacute carina, shortly reflected in front; peristome thin, labiate within, a little expanded above, reflected below, margins approaching. Diam. 14·6 mill.—

Water Key, Ragged Isl., Bahamas.

H. desidens, Rang. Pl. 18, fig. 60.

Moderately umbilicated, striate, thin, brownish, without bands; whorls 4½, flattened above, periphery obtusely angulated, base convex; peristome a little expanded above, scarcely reflected below.

Diam. 16 mill.

Ins. Martinique.

Section II, Campylæa, Beck, 1837.

Subsection I, Xerocampylæa, Kobelt, 1871.

H. Zelebori, Pfr. Pl. 4, figs. 69–72.

Very narrowly umbilicated, rather thin, lightly, subarcuately striate, whitish, unicolored or with two chestnut spiral lines, apex corneous; whorls 5½, moderately convex, regurlarly increasing, the last scarcely descending in front; aperture light flesh colored, peristome simple, very thinly labiate, margins approaching.

Diam. 14·5 mill.

Servia, Bosnia.

Has the characters in part of both *Xerophila* and *Campylæa*; hence forms the passage between the two groups.

H. Dragorichi, Zelebor. Pl. 45, figs. 22–24.

Narrowly umbilicated, solid, striate, a little shining, white, apex corneous, suture smooth; whorls 5½, slightly convex, the last dilated in front, scarcely descending, aperture oblique, wide, peristome simple, white-lipped, margins approaching, columellar margin dilated above. Diam. 16 mill.

Samsum, Asia Minor.

A var. *minor* has more elevated spire, and a very light yellowish band. Diam. 14 mill.

H. nubigena, Charp. Pl. 45, fig. 21.

Narrowly umbilicated, striate, whitish, sometimes becoming yellowish or rosy at the aperture; whorls 5, slightly convex, regularly increasing, the last rounded, slightly descending in front; peristome acute, white-lipped within, margins approaching. Diam. 11 mill.

Bareges, Pyrenees.

Unfigured Species.

H. carosina, H. Bortana, H. Ottoi, H. acaria, H. Twartkoi, H. nactara, Servain. *Bosnia.*

H. Adarella, Bourg. *Croatia.*

Subsection II, Fruticocampylæa, Kobelt, 1871.

H. Narzanensis, Krynicki. Pl. 20, figs. 17, 18, 19.

Moderately umbilicated, thin, pellucid, obsoletely transversely, and still more faintly longitudinally striated, whitish, unicolored, or with two bands; whorls 6, rounded; peristome reflected, margined within, the extremities remote. Diam. 8 mill.

Caucasus, Georgia.

H. hortensis, Menetr. and *H. Ossetinensis*, Bayer are synonyms.

Var. *β*, solidior. Fig. 19.

Larger, heavier, bifasicate. Diam. 22 mill.

Var. *δ*. perlineata.

More depressed, with a single superior band and minute decurrent lines.

Var. Suanetica, Böttger. Pl. 20, figs. 20–22.

Strongly striated, coarsely granular, spiral striæ very faint, with two distinct chestnut bands and brownish base.

Diam. 11·5–16·5 mill.

Var. MACROMPHALA, Böttger. Pl. 20, fig. 23, 24.

Umbilicus wider, surface obsoletely, very minutely granular and spirally undulately lineolate, light chestnut color with a white band, here and there strigated with chestnut. Diam. 15·5–19 mill.

Var. CYCLOTHYRA, Böttger. Pl. 20, figs. 33, 34.

Larger, usually more depressed, umbilicus much wider, margins of aperture approaching more closely. Diam. 19–22 mill.

Var. APPELINSI, Mousson. Pl. 20, fig. 25.

More widely umbilicated, irregularly but strongly crispate-striate, intermingled with elongated granulations, dull, light corneous, with a pale dorsal band; whorls 6, flattened, the last descending slightly in front, periphery sometimes subangulated; peristome a little expanded, slightly but widely labiate within, margins converging. Diam. 15–19 mill.

H. RAVERGIENSIS, Fér. Pl. 20, figs. 13, 14.

Narrowly umbilicated, rather thin, slightly pellucid, obliquely striate, yellowish gray, with white bands at the suture and periphery; whorls 6, obliquely planulate, suture snperficial; peristome patulous, with a white lip within. Diam. 7 mill.

Caucasus, Georgia.

It is *H. Caucasica*, Pfr., and *H. limbata*, Kryn.

Var. PERSICA, Böttger. Pl. 20, figs. 15, 16.

More conically depressed, thicker, with thread-like striæ, here and there rib-like, violet corneous, radiately strigate with white, bands narrower and fainter. Diam. 17·5 mill.

Astrabad, Northern Persia.

Var. TRANSCAUCASICA, Bayer. Pl. 20, figs. 31, 32.

Differs from the type in the smaller more depressed, less striate shell; umbilicus narrower; corneous. Diam. 15, alt. 12 mill.

Southern Caucasus.

H. PRATENSIS, Pfr. Pl. 20, figs. 26–30.

Moderately umbilicated, rugosely striate, whitish, with two chestnut bands, or without bands, and the last whorl becoming brownish flesh color; whorls 6, the last scarcely descending in front; peristome expanded, remotely white lipped within, margins approaching. Diam. 17 mill.

Riv. Tortoom, Asiatic Russia.

H. Bayerii, Parr. is a synonym.

Var. DELABRIS, Mousson. Pl. 21, figs. 46, 47.

Perforate, rather thin, chalky, irregularly striulate and slightly and very minutely granular, white, doubly banded with brown, apex corneous, suture scarcely impressed; whorls 5½, somewhat convex, the last slightly descending in front; base plano-convex; aperture white, with translucent band, peristome acute, expanded, not labiate within, margins approximating. Diam. 15 mill.

Transcaucasia.

Var. JOANNIS, Mortillet. Pl. 20, figs. 41, 42.

Moderately umbilicated, somewhat solid, distinctly striate, subrugose, whitish or fulvous gray, sparsely pellucid-dotted and with two dark chestnut bands; whorls 6, slightly convex, the last descending in front; peristome scarcely expanded above, white-lipped within, the margins converging and joined by a thin callus.

Diam. 17–25 mill.

Erzeroum, Armenia.

H. Dumonti, Mortillet is a synonym.

H. PONTICA, Böttger. Pl. 20, figs. 35–40.

Narrowly umbilicated, slightly shining, distinctly spirally lineolate, scarcely granular, white unicolored, or with two chestnut bands or the upper or lower one absent. Diam. 18–21 mill.

North of Suchum, Caucasus.

H. EICHWALDI, Pfr. Pl. 21, figs. 48, 49.

Rather widely umbilicated, rugosely striate, shining, whitish, with horny dots and doubly banded; whorls 6, scarcely convex, the last deflected in front; peristome expanded, prominently, remotely white-lipped within, margins acute, almost continuous. Diam. 18 mill.

Caucasus.

Var. DAGHESTANA, Parr. Pl. 21, figs. 50, 51.

Widely umbilicated, rugosely striate, shining, corneous, radiately strigate with white, with a median white band, suture linear; whorls 6, a little convex, the last deflected at the aperture; peristome acute, slightly expanded, white-lipped, margins approximating.

Diam. 16 mill.

Daghestan, Caucasus.

H. ARMENIACA, Pfr. Pl. 21, figs. 52–54.

Moderately umbilicated, plicately striate, variegated with corneous and ashy white; whorls 6, depressed, the last angulated, shortly de-

flected in front; peristome simple above, shortly reflected below, remotely white-lipped within, margins approaching.

Diam. 11 mill.

Armenia, Caucasus.

H. Ziegleri, var. *Airumia*, Siemaschko is a synonym.

H. PHÆOLÆMA, Böttger. Pl. 45, figs. 18–20.

Narrowly perforate, globose-conic, very solid, bluish-white, with brown apex and occasional radiating streaks; spire elevated, apex minute, acute; whorls 6½, slowly increasing, rugose-striate, sparsely and lightly marked with spiral lines, the last whorl subangulate in front of the aperture, deflexed anteriorly, rounded below; aperture small, round-lunate, oblique, castaneous within; peristome expanded, labiate with white, the extremities converging slightly, columella dilated, reflexed. Diam. 14 mill, alt. 11·5 mill.

Mt. Schach-Dagh, Oriental Caucasus.

Unfigured Species.

H. MENETRIESII, Kalenicz, *Caucasus.*

H. ALPINA and H. NIVALIS, Menetr. are synonyms.

H. DICHROZONA, Martens. *Ko Kand.*

H. NYMPHÆA, Dubois. *Transcaucasia.*

Subsection III, EUCAMPYLÆA, Pfr. 1881.

I, *Group of H. pouzolzi*, Desh.

H. POUZOLZI, Desh. Pl. 22, fig. 75.

Widely umbilicated, striate, spirally lineated above, olivaceous brown, with three chestnut bands, the middle one narrowest; whorls 6, somewhat flattened, the last deflected in front; peristome thickened and reflected, whitish or flesh color. Diam. 40–48 mill.

Dalmatia, Albania.

The synonyms are *H. Savignyana*, Ehrenb., *H. Varronis*, Cantr., *H. Brenoensis*, and *H. Macarana*, Mühlf., *H. Dalmatina*, Parr. and the following color varieties: var. *trifasciata*, Bielz (typical), var. *bifasciata*, Brus., var. *unifasciata*, Pfr., var, *obscura*, Bielz (more or less dark chestnut with scarcely distinct bands), var. *unicolor*, Pfr. (no bands).

Var. MONTENEGRINA, Zglr. Pl. 22, fig. 76.

Small, olive green, distinctly dark banded, peristome but slightly thickened. Diam. 30 mill.

Var. BOSNIENSIS, Kobelt. Pl. 22, fig. 77.

Smaller, spire a little elevated, whorls planulate above, with three distinct, subequal bands. Diam. 31 mill.

Bosnia.

H. Ragusana, Fér. and *H. trizona*, Reeve are synonyms.

H. SERBICA, Mollend. Pl. 21, figs. 66–68.

Moderately umbilicated, striulate, and slightly spirally lineate above, olivaceous brown, with three chestnut brown bands, the middle one narrower, the outer ones diluted on the exterior sides, suture deep; whorls 6, slowly increasing, the last slightly descending in front; peristome simple, acute, margins distant, columellar lip a little expanded, partly covering the umbilicus. Diam. 27 mill.

Servia.

Var. UNITÆNIATA, Böttger.

Ferrugineus, with a supra-median black band; aperture rosy white or purplish within. Diam. 29 mill.

Montenegro.

H. PAUCICI, Mollend. Pl. 21, figs. 69–71.

Widely umbilicated, striulate, and spirally lineate above, olivaceous brown, with three chestnut brown bands; whorls 6½, rounded, flattened below, the last whorl slowly descending at the aperture; peristome simple above, angulately subreflected and a little dilated below. Diam. 30 mill.

Servia.

Flatter, with wider umbilicus than the preceeding species, and flattened base.

H. STENOMPHALA, Menke. Pl. 21, figs. 63–65.

Narrowly umbilicated, lightly striate, yellowish, with three chestnut bands, the outer one wider and diluted; whorls 5½, somewhat convex, the last inflated, scarcely descending in front; peristome a little reflected, white-lipped within, margins distant, columellar margin dilated and reflected, partly covering the umbilicus. Diam. 31 mill.

Croatia.

II, *Group of H. planospira*, Lam.

H. HIRTA, Menke. Pl. 23, figs. 10–12.

Umbilicated, spire plane, thin, slightly striate and punctate-granular, hairy, pellucid, somewhat shining, yellowish corneous, with a chestnut band; whorls 4½, somewhat flattened, the last scarcely descending; peristome reflected, flexuous, white-lipped.

Diam. 21 mill.

Illyria, Croatia.

H. deplana, Zglr., is a synonym.

H. LEFEBORIANA, Fér. Pl. 25, figs. 56–58.

Umbilicated, spire plane, thin, hairy, ashy corneous, with a single chestnut band; whorls 5, flattened, the last deflected in front; peristome acute, reflected, white-lipped, margins approaching.

Diam. 29 mill.

Illyria, Carniola.

H. Feburiana, Rossm., *H. deplana*, Mühlf., and *A. hirsuta*, Brum. are synonyms.

H. HAZAYANA, Clessin. Pl. 45, figs. 35–37.

Large, widely umbilicated, much depressed, rather solid, finely striate, beset with long shaggy crooked hairs, corneous, with a pale brown band above, succeeded by a clear zone, and below this a third band of brown; whorls flat, 5½ in number, slowly increasing, separated by a deeply impressed suture, the last double the width of antepenultimate, shortly deflexed anteriorly; aperture oblique, widely lunar, slightly wider than high; peristome sharp, expanded; columella extended. Diam. 22 mill.

Northern Hungaria.

H. SADLERIANA, Ziegler. Pl. 22, figs. 78, 79.

Widely umbilicated, slightly striate and closely punctate-granular, thin, pellucid, shining, with short, close, regularly disposed hairs, light yellowish corneous, with a chestnut, white-margined band; whorls 5½, flattened, the last subdeflected in front; peristome a little deflected, subthickened, whitish, margins distant.

Diam. 30–38 mill.

Croatia, Carinola.

H. PLANOSPIRA, Lam. Pl. 22, figs. 80, 82.

Moderately umbilicated, solid, striulate, greenish corneous, with a superior chestnut white margined band, spire obtuse, slightly ele-

vated; whorls 5, scarcely convex, the last slowly descending in front; peristome white-lipped, dextrally slightly expanded, basally shortly reflected, columellar margin dilated, margins remote.

Diam. 22–26 mill.

Southern France, Northern Italy.

H. adelozona, Parr.

Var. KOBELTIANA, Clessin. Pl. 48, fig. 90.

Larger than type, whorls elevated, thick, the last whorl double as broad as penultimate, aperture wide, transversely ovate, umbilicus wide, partially covered by reflection of columellar lip.

Carinthia (Kärnthen.)

Var. UMBILICARIS, Brumati. Pl. 22, fig. 85.

Much depressed, widely umbilicate, exhibiting all the whorls to apex; last whorl and aperture decidedly widened, base of peristome flattened.

Northern Italy.

H. Hispanica, Linn. and *H. zonata*, C. Pfr.

Var. ILLYRICA, Stabile. Pl. 22, fig. 86.

More or less subglobose depressed, glabrous, pale corneous colored, with an evanescent fascia.

Illyria.

Var. PADANA, Stabile. Pl. 22, figs. 83, 84.

Small, subglobose depressed, spire convex, last whorl rounded, aperture less horizontal than in the type, and more rounded:

Diam. 25–27 mill.

Northern Italy.

Var. ULLEPITSCHEI, Westerl. Pl. 48, fig. 91.

Depressed solid, aperture transversely oval, columellar margin immersed in umbilicus. Diam. 32, alt. 16 mill.

Southern Austria.

Var. STABILLEI, Paulucci. *Not figured.*

Var. SETULOSA, Briganti. Pl. 22, fig. 92.

Opaque, rather thin, rich brown; sharply rugulose, with black hairs arranged in oblique series, a dark supra-peripheral band, bounded on either side with whitish, whorls 4½–5, the last slightly descending, gibbous at the base; aperture rotund-lunar, slightly oblique, brown within, labiate. Diam. 26, alt. 13 mill.

Central Italy.

H. setipila, Zglr.

Var. PUBESCENS, Tiberi. Pl. 22, figs. 88, 89.

Very similar to the last variety; sparsely pilose, pale reddish brown, whorls 5, the last rounded, slightly descending anteriorly, base convex, umbilicus moderate, peristome brown-labiate, columellar margin subreflexed. Diam. 23, alt. 12 mill.

Abruzzen.

Var. CASERTANA, Paulucci. Pl. 22, fig. 87.

Sparsely hirsute, rather dark colored; peristome rather widely reflected, milky white or yellowish, spotted everywhere with violet to the point of its insertion; last whorl rounded below.

Diam. 23½–26 mill, alt. 13–14 mill.

Caserta Vecchia.

Var. CALVA, Kobelt.

Distinguished from the type by the lack of hairs or hair scars.

Central Italy.

H. depilata, Orsini, Mss.; *H. planospira*, var. *depilata*, Paul.

Var. CALABRICA, Paulucci. Pl. 22, fig. 90.

Translucent; totally destitute of hairs, but with slight traces upon the embryonic whorls, depressed globose, umbilicus narrow, the columellar margin reflected over it; aperture rotund-ovate, last whorl much dilated below. Diam. 25–28 mill.

Calabria.

Var. NEAPOLITANA, Paulucci. Pl. 23, figs. 93, 94.

In form like the type; minutely granulate and sparsely hirsute, rather opaque, umbilicus rather large, last whorl more depressed and more descending anteriorly; peristome yellowish, mottled with darker color. Diam. 19–24 mill.

Castellamare.

Var. CASSINENSIS, Paulucci. Pl. 23, fig. 97.

In form like typical *planospira;* last whorl more rounded; hairy; clear horn colored; aperture rounded, peristome subreflexed at the base. Diam. 20–24 mill.

Mt. Cassino.

Var. EUGANEA, Stabile.

Smaller and thinner than var. *padana*, to which it is similar in form; shining. *Padua.*

Var. ALIFAENSIS, Paul. Pl. 23, fig. 95.

Large, thin, fragile, opaque, sparsely and shortly pilose; last whorl inflated; aperture wide, rounded. Diam. 29, alt. 16 mill.

Terra di Lavoro, Italy.

H. ZONATA, Studer. Pl. 28, figs. 34–36.

Umbilicated, olivaceous, with a chestnut band, subpellucid; whorls 5½, somewhat convex, the last descending in front; peristome simple, reflected below; expanded above, margins nearly joining. Diam. 21 mill.

Switzerland, Northern Italy.

H. fœtens, Stud., is a synonym.

Var. MODESTA, Moquin-Tandon.

Lacks the band of the typical form.

H. flavo-virens, Dum. et Mort. is a synonym.

H. CONFUSA, Benoit. Pl. 23, figs. 98–100.

Narrowly umbilicated, solid, opaque, striulate, granular above, chestnut corneous, with a chestnut, white or yellowish margined band; whorls 5, slightly convex, the last slowly descending in front; peristome thick, flexuous, reflected, white-lipped, callous below. Diam. 25–33 mill.

Sicily.

Mdme. Paulucci makes this a variety of *H. planospira*.

H. MACROSTOMA, Mühlf. Pl. 23, figs. 1, 2, 5, 6.

Openly umbilicated, opaque, very minutely granular above, yellowish, with a chestnut band; whorls 5, scarcely convex, the last descending in front; peristome widely reflected, white-lipped, margins approaching. Diam. 29 mill.

Sicily.

It is *H. planospira*, Phil., *H. pervia* and *H. didyma*, Mühlf., *H. siculina* and *H. cryptozona* (figs. 5, 6), Ziegler; the last a smaller, thinner, diaphanous form.

Var. BENEDICTA, Kobelt. Pl. 23, figs. 3, 4.

Perfectly plane above, last whorl abruptly descending in front lurid fulvous, with long hairs arranged in quincunx order.

H. Lefeburiana, Phil., and *H. trichophora*, Bourg., *H. setipila*, Benoit (not Ziegler) are synonyms.

Var. ERETA, Paulucci.

Shell oval, last whorl much widened toward the aperture.

Palermo.

H. SUBZONATA, Mousson. Pl. 29, figs. 37–39.

Umbilicated, dark corneous, with a dark band, pale-margined below, striate, with very minute granulations, obsoletely hairy; whorls 5, somewhat convex, the last without hairs, a little descending in front; aperture grayish, showing the exterior band, peristome subthickened, whitish, shortly reflected, margins somewhat approaching. Diam. 23 mill.

Cephalonia and Epirus.

Var. DISTANS, Blanc. Pl. 29, figs. 40, 41.

More distinctly striate and granular, whitish zone conspicuous, umbilicus narrower, suture whitish margined.

Ins. Corfu.

H. FŒTENS, C. Pfr. Pl. 25, figs. 59–62.

Widely umbilicated, corneous brown, with a chestnut band margined with white below, translucent, substriate; whorls 5½, flattened, the last deflected in front; peristome simple, expanded, right margin reflected, extremities approaching. Diam. 21–27 mill.

Mts. Switzerland and Southern Austria.

The synonymy includes *H. cornea*, Voith, *H. euzona*, Menke, *H. marginata*, Mühlf., *H. achatina*, Pot. et. Mich., *H. cingulina*, Desh., var. *Dufftii*, Kobelt (subfossil).

Var. ACHATES, Ziegler. Pl. 25, figs. 59, 60.

Rather smaller than type; whorls more elevated, the peripheral white band broader, the dark band conspicuous; keel scarcely indicated. Diam. 19 mill.

Alps of Southern Bavaria, North Tyrol, etc.

Var. ICHTHYOMMA, Held. Pl. 25, fig. 63.

Depressed finely striate, shining, thin, translucent, corneous, with a rufous band, bordered with white below; whorls 5½, flattened, the last widened, descending anteriorly, convex below; sutures deep; aperture very oblique, compressed ovate, peristome labiate, white, ends not converging, reflected on basal margin. Umbilicus wide and deep. Diam. 22 mill.

Bavarian Alps.

Var. CISALPINA, Stabile. Pl. 26, fig. 64.

Large, thin, subpellucid, umbilicus narrow, last whorl convex below; narrow brown band not bordered with white. Diam. 27 mill.

Southern Alps.

H. vittata, Jan. and *H. sebinensis*, Kobelt are synonyms.

Var. ADAMI, Kobelt. Pl. 26, fig. 65.

Umbilicus more widely perspective than in var. *cisalpina*, last whorl flattened below; conspicuously banded. Diam. 32 mill.

Southern Alps.

H. Calabriensis, Jan. is a synonym.

Var. RHAETICA, Mouss. Pl. 26, fig. 66.

Shell larger and more solid than in the type; whorls less carinated, flattened below; with a very distinct castaneous band. Diam. 27 mill.

Mountain valleys of the Rhine and Inn.

Var. DEBETTÆ, Adami. Pl. 45, fig, 25.

Small depressed, solid. Diam. 18, alt. 6–8 mill.

Southern Tyrol.

H. ARGENTELLEI, Kobelt. Pl. 26, figs. 67, 68.

Moderately umbilicated, striulate, olivaceous brown, with a chestnut, white margined band; whorls 5, the last subangulate, descending in front; peristome a little reflected, the margins approaching, columellar lip dilated above, partly covering the umbilicus. Diam. 18–26 mill.

Taygetus, Greece.

H. KOLLARI, Zelebor. Pl. 24, figs. 19–21.

Moderately umbilicated, rather thin, striulate and sparsely pilose, especially at the periphery (the hairs leaving pits), corneous, with a white margined chestnut band; whorls 5½, scarcely convex, the last depressed, descending in front, base light-colored about the umbilicus; peristome white, sublabiate, shortly expanded, reflected below, extremities closely approaching. Diam. 17·5–23 mill.

Servia.

H. PYRENAICA, Drap. Pl. 23, figs. 13–15.

Narrowly umbilicated, flattened above, thin, pellucid, olivaceous corneous; whorls 5, rather flattened, the last not descending; peristome acute, reflected, white-lipped. Diam. 19 mill.

Pyrenees.

Var. COMPLANATA, Bourg. Pl. 23, fig. 16.

Shell thin, suture profound, peristome horizontal, not arcuate at base.

Pyrenees.

H. xanthelea, Bourg. is a synonym.

H. FAUSTINA, Ziegler. Pl. 29, figs. 46, 47.

Narrowly umbilicated, smooth, shining, yellowish above, with a chestnut band, brownish below; whorls 5, scarcely convex, the last not deflected in front; peristome white-lipped, angularly reflected, margins somewhat converging. Diam. 18 mill.

Galicia, Volhynia, Silesia.

H. selemine, Mühlf., *H. Volhyniensis*, Andrz., and *H. cornea*, Fitz., are synonyms.

Var. CITRINULA, Ziegler.

Smaller, yellowish, without band.

Var. SATIVA, Ziegler.

Orange chestnut color.

Var. ASSOCIATA, Ziegler. Pl. 29, figs. 48–50.

Spire flatter, umbilicus wider, last whorl profoundly deflected in front, aperture oblique.

Transylvania and Bucovina.

H. Javnaensis, Parr. is a synonym.

Var. CHARPENTIERI, Scholtz.

Umbilicated, depressed, lightly and irregularly striate, corneous brown above, with an ill-defined reddish brown band, yellowish brown below, shining.

Silesia.

H. MOLLENDORFFI, Kobelt. Pl. 29, figs. 42–45.

Narrowly umbilicated, thin, pellucid, striate, corneous brown, with a single chestnut band, with regular, sparse, long hairs; whorls $5\frac{1}{2}$, regularly increasing, slightly convex, the last suddenly descending in front; peristome reflected, white-lipped, margins subcontinuous.

Diam. 14–18 mill.

Bosnia, Servia.

Has the form of *H. faustina*, but differs in the aperture and narrower umbilicus, and is pilose.

H. Rossmassleri, Pfr. Pl. 29, figs. 51–53.

Very narrowly umbilicated, thin, yellowish above, with a single chestnut band, brownish below; whorls 4½, slightly convex; peristome acute, thin, reflected, margins distant. Diam. 12 mill.

Carpathian Mountains.

Smaller than *H. faustina*, with narrower umbilicus and the peristome not thickened. *H. adrena*, Rossm. is a synonym.

H. sclerotricha, Bourg. Pl. 23, figs. 7–9.

Very narrowly umbilicated, slightly convex above, more so below, not shining, thin, a little pellucid, corneous chestnut color, lighter around the umbilicus, with two lighter zones, last whorl strongly striate, with erect rigid hairs in quincunx order, apex obtuse, malleate; whorls 6, rather rapidly increasing, the last compressed rounded, slowly descending in front; peristome whitish, slightly thickened, reflected, margins remote, joined by a thin callus.

Diam. 32 mill.

Kabylia, N. Africa.

It is *H. schlærotricha*, Bourg. (err. evid.).

H. Pindica, Böttger. Pl. 45, figs. 26, 27.

Narrowly umbilicated, depressed, thin, subopaque, reddish corneous, with a brown supraperipheral fascia, bounded below by a light tract, spire convexo-conic, depressed, whorls over 5, regularly increasing, slightly convex, striulate and somewhat granulate, with short, deciduous sparse hairs, last whorl subangulate, descending in front; aperture very oblique, oval, peristome brown, expanded, dilated and reflexed at columella. Diam. 24, alt. 13 mill.

Karawa.

A more depressed form than *H. subzonata*, with wider aperture and less distinctly pilose. Distinguished from Kobelt's *H. Argentellei* by the much narrower umbilicus, etc.

H. comephora, Bourg. Pl. 24, figs. 22–24.

Umbilicated, thin, subdiaphanous, fulvous, corneous, with a superior light chestnut band; with erect rigid hairs; whorls 5, somewhat flattened, the last descending in front; peristome acute, simple above, reflected below, margins approaching. Diam. 27 mill.

Morea.

H. setipila, Bourg. is a synonym.

H. Banatica, Partsch. Pl. 22, figs. 72–74.

Openly umbilicated, very minutely decussated, opaque, olivaceous brown, with a chestnut band; whorls 5½, somewhat flattened, the last not descending in front, carinated, carina vanishing towards the aperture; peristome acute, white-lipped, outer margin expanded, columellar margin dilated and reflected. Diam. 30 mill.

Transylvania.

It is *H. prætexta*, Ziegl.

H. Thayaca, Bourg. Pl. 21, figs. 60–62.

Imperforate, opaque, solid, olivaceous brown, elegantly striulate, spire roof-like; whorls 6, regularly slowly increasing, flattened and carinate, the carina following the suture, becoming evanescent in the last whorl, which descends at the aperture; peristome obtuse, labiate, slightly patulous, columellar lip convex, callous, covering the umbilicus, margins joined by a parietal callus. Diam. 27 mill.

Prov. Constantine, Algeria.

Unfigured Species.

H. Brenskei, Böttger. *Corinth.*
H. Conemenosi, Böttger. *Sontameri, Greece.*

III, *Group of H. setosa*, Zglr.

H. setosa, Ziegler. Pl. 31, figs. 94, 95.

Widely umbilicated, slightly striate and subgranular, thin, pellucid, shining, with rather long dense, irregularly disposed hairs, yellowish corneous, three banded with chestnut; whorls 5½, somewhat convex, the last deflected in front; peristome continuous, solute, widely reflected, sublabiate, the basal margin subdentate.

Diam. 30 mill.

Istria, Croatia, Dalmatia, Albania.

H. setosula, Briganti is a synonym.

Var. pilosa, Stentz.

Whitish-yellow, without bands.

Var. imberbis, Brusina.

Flatter, a little rugose, shining, without hairs.

Var. *denudata*, Zeleb. is a synonym.

Var. litoralis, Brus.

More rugose and opaque, hairs shorter, bands lighter.

H. Walteri, Böttger. Pl. 45, figs. 28, 29.

A form intermediate between *H. insolita* and *H. Hoffmani*. From the former it is distinguished by the thicker, more expanded lip, wider band and microscopic short hairs. From *H. Hoffmani* the the number of hairs at once separate it, that species having 9 to 12 hairs to a square mill., whilst the *Walteri* shows 25–30 in the same space. Diam. 25–28, alt. 15–17 mill.

Sutomore, Alps.

H. Nicolai, Kleciach. Pl. 30, figs. 76–78.

Openly umbilicated, somewhat solid but subtranslucent, obliquely rugose, ribbed-striate, not hairy, grayish yellow, with three fulvous bands; whorls 5, slightly convex, slowly increasing, the last rather narrow, deflected in front; peristome continuous, widely reflected, labiate within, basal margin subdentate. Diam. 26 mill.

Dalmatia.

H. recordera, Parr. is a synonym.

H. Brusinæ, Stossich. Pl. 30, figs. 82–84.

Widely umbilicated, flattened above, lightly striate and granular, thin, subpellucid, with very dense short hairs, somewhat regularly disposed, yellowish white, with three chestnut bands, the middle one narrowest; whorls 5½, the last deflected in front; peristome continuous, solute, widely reflected, columellar margin unidentate.

Diam. 32 mill.

Mts. Biokovo, Dalmatia.

H. insolita, Ziegler. Pl. 24, figs. 35, 36.

Openly umbilicated, striate, slightly granular, thin, pellucid, shining, not hairy, light yellowish, three-banded with chestnut, outer bands interrupted or fading; whorls 5½, convex, the last deflected in front; peristome reflected, somewhat thickened, margins subcontinuous, columellar margin dilated, tuberculated below.

Diam. 29–32 mill.

Dalmatia, Albania.

It is *H. subcostalis*, Parr.

Var. denudata, Rossm. Pl. 24, figs. 37, 38.

Turbinately depressed; whorls 6, slightly convex, the last suddenly deflected in front; peristome continuous, solute.

H. PRÆTEXTA, Parr. Pl. 25, figs. 42–44.

Moderately umbilicated, somewhat solid, closely subrugosely striate, light fulvous, with three chestnut bands, the third below the periphery; whorls 5, somewhat convex, the last depressly rounded, descending in front, subconstricted on the base behind the mouth; aperture trifasciate, peristome sublabiate, expanded above, shortly reflected below and obsoletely dentate, margins approaching, scarcely connected by a thin callus. Diam. 27 mill.

Dalmatia.

It is *H. insolita* var. *rugata*, Kutsch., and *H. insolita* var. *costulata*, Bielz.

H. HOFFMANNI, Partsch. Pl. 24, figs. 32–34.

Narrowly or subcovered perforate, very slightly striate and punctate granular, thin, subpellucid, shining, with very short and dense irregular hairs, yellowish, one rarely obsoletely three-banded; whorls 5½, convex, the last deflected in front; peristome widely reflected, sublabiate, margins subcontinuous, with a basal callus.

Diam. 35 mill.

Dalmatia.

H. monozona, Zglr. is a synonym.

H. KLECIACHI, Parr. Pl. 30, figs. 79–81.

Moderately umbilicated, rather thin, very closely, minutely granular, with somewhat close, short, erect hairs, light fulvous, with three subequal chestnut bands, whereof two are above the periphery; whorls 5, scarcely convex, the last depressly rounded, abruptly deflected in front, constricted at the aperture below; peristome white-lipped, expanded, reflected below, tuberculate within, columellar margin expanded, half covering the umbilicus, margins joined by a sinuous callus. Diam. 30 mill.

Dalmatia.

H. lucescens, Kutsch. is a synonym.

H. NARENTANA, Kleciach. Pl. 24, figs. 39–41.

Rather narrowly umbilicated, thin, semipellucid, striulate, yellowish corneous, with three narrow chestnut bands, the middle one most distinct; whorls 5, rounded, the last one dilated, inflated below, suddenly deflected at the aperture; peristome slightly reflected, margins approaching and joined by a callus, columellar margin edentulous, dilated above, covering half of the umbilicus.

Diam. 24–29 mill.

Mts. of Narenta, near Ragusa.

H. SETIGERA, Ziegler. Pl. 30, figs. 88–90.

Narrowly umbilicated, lightly striate and punctate-granular, thin, pellucid, shining, with rather long, dense, erect hairs, irregularly disposed, yellowish, with three pale bands, the middle one most distinct; whorls 5, convex, the last deflected in front, peristome slightly reflected, continuous, but not solute, columellar margin subdentate. Diam. 20–26 mill.

Dalmatia, Croatia.

It is *H. setosa*, var., Rossmässler.

H. CRINITA, Sandri. Pl. 30, figs. 85–87.

Umbilicated, somewhat solid, irregularly rugose, slightly punctate granular, with a few regularly disposed, recurved hairs, brownish corneous with three light chestnut bands; whorls 5½ flattened, the last deflected in front; peristome continuous, solute, widely reflected, labiate, columellar margin subdentate. Diam. 28 mill.

Dalmatia.

IV, *Group of H. alpina*, Faure-Biguet.

H. ALPINA, Faure-Biguet. Pl. 28, figs. 11–13.

Widely umbilicated, striate, with fine, undulating spiral lines, yellowish, the deciduous epidermis variegated with brown; whorls 5, convex, the last with obsoletely angulated periphery; peristome simple, white-lipped, shortly reflected below. Diam. 19 mill.

Alps of France, Illyria.

Var. PHALERATA, Ziegler. Pl. 28, figs. 24–27.

With a single band. Diam. 20 mill.

H. Thessalonica, Mouss, is a synonym.

Var. FONTENILLII, Michaud.

Widely umbilicated, pellucid, marbled with whitish and corneous, periphery carinated. *Eastern France.*

Westerlund, who considers this a distinct species, has a variety *alpicola.*

H. HERMESIANA, Pini. Pl. 29, figs. 98–100.

Moderately umbilicated, solid, shining, striate, and with slight spiral lines, ashy white or light rosy, usually with a single median, narrow, chestnut band; whorls 5½, rounded convex, slowly increasing, the last dilated, subinflated, suddenly deflected in front, suture

deep; aperture vinous brown, with band, peristome white-lipped, margins remote, expanded above but scarcely reflected, basal and columellar margins more reflected. Diam. 25 mill.

Mt. Presolano, N. Italy.

Var. LIGURICA, Kobelt. Pl. 27, fig. 4.

Smaller, last whorl less dilated, aperture rounded. Diam. 20 mill.

H. FRIGIDA, Jan. Pl. 24, figs. 25–27.

Openly moderately umbilicated, planospiral, solid, ashy white; whorls 5, convex, the last scarcely descending in front, subcompressed around the umbilicus; aperture brownish, peristome white-lipped, margins distant. Diam. 21 mill.

Alps of Northern Italy.

Var. INSUBRICA, Crist. et Jan. Pl. 27, fig. 28, Pl. 23, fig. 17.

Smaller, single banded. Diam. 18 mill.

H. Bertelliana, and *H. frigidissima*, Adami, (fig. 17) are synonyms.

H. NICATIS, Costa. Pl. 23, fig. 18.

Rather widely umbilicated, somewhat solid, subarcuately striate, a little shining, whitish, with obsolete corneous maculations, spire subplane, suture impressed; whorls 5, somewhat flattened, the last with a light chestnut band above the middle, scarcely descending in front, base more convex; aperture brownish flesh color, peristome simple, reflected basally, margins joining. Diam. 20 mill,

Mt. Nicatis, Naples.

H. CHAMAELEON, Parr. Pl. 28, figs. 28–30.

Narrowly umbilicated, somewhat solid, obliquely striate, with impressed spiral lines above, closer at the periphery, brownish, dotted with white, with a chestnut, white-margined periphery band, marbled with chestnut and white below, whorls 5, barely convex above, the last more convex below, scarcely descending in front; peristome labiate, margins converging, shortly expanded above, subflexuous, basally reflected. Diam. 19 mill.

Near Malborghet, Carinthia.

Kobelt considers this possibly a variety of *H. phalerata.*

H. OLYMPICA, Roth. Pl. 28, figs. 19–21.

Umbilicated, striate, whitish, with a single narrow chestnut band, epidermis deciduous; whorls 5, rounded, the last descending at the

aperture; peristome simple, margins approximating, and joined by a thin callus. Diam. 22 mill.

Mt. Olympus, Greece.

Var. Ossica, Böttger. Pl. 28, fig. 22.

Smaller than type, umbilicus narrower; solid, obscure olive-brown, brown band margined with yellow above, spire depressed conic, whorls 5½. Diam. 21–24 mm.

Mt. Ossa, Thessaly.

Var. Magnesiæ, Böttger. Pl. 28. fig. 23.

Large, umbilicus small for size of shell; form depressed conic; fascia widely margined above and below with whitish.

Diam. 33–36 mill.

Mt. Ossa, Thessaly.

H. Gasparinæ, Charp. Pl. 21, figs. 57, 58.

Umbilicated, solid, striate, bluish white, with a chestnut, white margined median band; whorls 5, rounded, the last scarcely descending at the aperture; peristome simple, acute, margins approximating, joined by a very thin callus, basal margin slightly reflected.

Diam. 23 mill.

Mt. Olympus, Greece.

Var. subdeflexa, Böttger. Pl. 21, fig. 59.

Shell much more depressed than type, solid, yellowish-corneous, last whorl descending at aperture.

Near Entrance of Vale of Tempe.

H. choristochila, Böttger. Pl. 45, figs. 30–32.

Narrowly umbilicated, depressed, solid, shining corneous brown, paler around the umbilicus; with a narrow supraperipheral brown band, which is margined above by a very narrow, below by a broad white tract; spire slightly convex, whorls over 4, regularly increasing densely irregularly striate, not granulose nor pilose, the last descending somewhat at aperture, peristome slightly expanded, labiate, upper and lower margins well rounded, distant.

Diam. 17·5 alt 9·3 mill.

Karawa.

Allied to the preceding, but smaller, with narrower umbilicus, etc.

H. Langi, Parr. Pl. 21, figs. 55, 56.

Widely umbilicated, slightly striate, whitish, with three narrow chestnut bands; whorls 5, a little depressed, slowly increasing, suture

moderately impressed; peristome reflected, margins joining, columella extended. Diam. 25 mill.

Mt. Parnassus, Greece.

H. Phocæa, Roth. Pl. 20, figs. 43–45.

Moderately umbilicated, somewhat solid, irregularly striated, grayish white, with three superior bands of chestnut, one of them sometimes obsolete, apex corneous; whorls 5, somewhat convex, the last subdepressed, suddenly deflected in front; aperture almost horizontal, brownish within; peristome scarcely labiate, simple above, shortly reflected below, margins approximating. Diam. 21–22 mill.

Mt. Parnassus, Greece.

Var. ornata, Parr.

Larger, distinctly trifasciate. Diam. 25 mill.

Var. inornata, Kobelt.

Smaller, the bands obsolete. Diam. 18 mill.

H. Schmidtii, Ziegler. Pl. 28, figs. 8–10.

Moderately umbilicated, slightly convex, solid, rugosely striate, brownish, variegated with yellowish or whitish; whorls 5–5½, the last scarcely deflected in front; aperture brownish; peristome white-lipped, scarcely expanded above, shortly reflected below, margins joining. Diam. 24 mill.

Alps of Carniola.

Var. Hessei, Kimakowicz. Pl. 35, fig. 11.

Strongly and irregularly striate, with weak spiral lines; dirty yellowish brown, with light strigations, and a scarcely indicated dark brown band; whorls less depressed than *H. Schmidti* and shell smaller. Diam. 19 mill.

Transylvania.

H. Carascalensis, Fér. Pl. 19, figs. 1, 2.

Narrowly umbilicated, striate, yellowish, variegated and subfasciolate with corneous; whorls 5½, slightly convex; peristome patulous, acute, slightly labiate, columellar margin widely reflected.

Pyrenees.

H. Velascoi, Hidalgo. Pl. 19, figs. 3–7.

Umbilicated, somewhat solid, irregularly striate, opaque white, strigate with brownish corneous; whorls 5½, convex, the last de-

scending in front, subdilated, peristome simple, white, scarcely labiate, basal margin shortly and the columella margin rather widely reflected. Diam. 15·5 mill.

Spain.

A variety is fulvous corneous, strigate with whitish, with a single peripheral band.

Unfigured Species.

H. Nansoutiana, Bourg.	*Pyrenees.*
H. Carascalopsis and H. Renei, Fagot.	*Haute Garonne.*
H. Nephæca, Fagot.	*France.*
H. Millieri, Bourg.	*Alps.*
H. Nicolisiana, Adami.	*Italy.*
H. Gallica, Bourg.	*France.*

V, *Group of H. cingulata*, Studer.

H. cingulella, Ziegler. Pl. 30, figs. 71, 72 (central fig.)

Widely umbilicated, rather thin, somewhat shining, striate, dirty white, radiated with bluish black, with a brown band above the periphery; whorls 5, depressed, the last obsoletely angulated above, shortly descending anteriorly; peristome subsimple, thin, a little expanded, the margins approximating. Diam. 16 mill.

Alps of Volhynia.

H. *zinguletta* of Ads. Genera, and *H. fortunata*, Parr. are synonyms.

H. Presslii, Schmidt. Pl. 27, figs. 91, 92.

Widely umbilicated, striated, ashy flesh-color, variegated with brown above and dilutely, faintly three banded; whorls 5, rather flattened, the last deflected in front; peristome reflected, sublabiate, margins joining. Diam. 27 mill.

Mts. Carniola, Northern Italy.

It is *H. insubrica*, Desh, and var. *intermedia* Paul.

Var. nisoria, Rossm. Pl. 27, figs. 93–95.

Middle band distinct, the others lost in the wide maculations.

H. cingulata, Studer. Pl. 26, figs. 73, 74.

Umbilicated, grayish flesh color, with a single chestnut band; whorls 5, scarcely convex, the last deflected in front; peristome

simple, acute, sublabiate within, expanded above, reflected below, columellar margin dilated; extremities approximating.

Diam. 26 mill.

Illyria, Tyrol, Northern Italy.

It is *H. striatula*, Fabr. *H. subflava*, Fér.

Var. ANAUNIENSIS, Betta. Pl. 26, figs. 75, 76.

Much smaller, pellucid, brown band darker. Diam. 25 mill.

Southern Tyrol.

Var. *athesina*, Paul. is a synonym.

Var. COLUBRINA, Jan. Pl. 26, figs. 77, 78.

Sprinkled with brown, with a pale band. Diam. 26 mill.

Tyrol.

Var. BALDENSIS, Villa. Pl. 26, figs. 79, 80.

Large, umbilicus wider, margins of peristome joining.

Diam. 29 mill. *Southern Tyrol.*

Var. LUGANENSIS, Schinz.

Flesh colored with brown band; aperture oblique oval, basal margin of peristome subrectilinear, horizontal, columellar margin dilated. Diam. 24 mill.

Lugano.

Var. CARRARENSIS, Porro. Pl. 26, fig. 81–83.

Depressed subglobose, whorls inflated, umbilicus narrow, subcylindrical, three banded, aperture nearly orbicular.

Diam. 24 mill.

Apuanian Alps.

Var. FRIGIDESCENS, del Prete. Pl. 28, figs. 14, 16.

Orbicular, subdepressed, inornate or unifasciate, whorls 6 to 7, regularly increasing, aperture pale brown, umbilicus wide.

Diam. 26 mill.

Apuanian Alps.

Var. APUANA, Issel.

Orbicular depressed, striate, widely umbilicus, wide aperture oblique, rotund-oblong. Diam. 26, alt 14 mill.

Apuanian Alps.

Var. APPELII, Kobelt. Pl. 27, figs. 88–90.

Suborbicular, depressed, umbilicus very wide, perspective, band wide, reddish brown, aperture rounded. Diam. 30 mill.

Paulucci considers this form a variety of *H. frigida.*

Apuanian Alps.

Var. NUBILA, Ziegler. Pl. 27, figs. 1–3.

Aperture dilated, suboblique, base subplanate, color as in var. *colubrina*. Diam. 27 mill.

Var. LUCENSIS, Paulucci.

Intermediate between *H. cingulata* and var. *apuana*. It is colored like the former, but more elevated with less inflated last whorl, and wider aperture and umbilicus. The whorls are less convex than in var. *apuana*, the sutures deeper, and the aperture larger.

Diam. 23, alt 15 mill. *Lucca.*

Var. AFFINIS, Paulucci. Pl. 27, fig. 97.

Similar to *H. cingulata*, but with more whorls, the last more swollen and descending above. It is more delicate and translucent than *H. Preslii*, with wider umbilicus and less enlarged last whorl.

Diam. 25, alt 12 mill.

Central Italy.

Var. ANCONÆ, Gentil. Pl. 28, figs. 5–7.

Differs from *H. Preslii* in the constantly more depressed form, wider umbilicus, smooth whorls, which are regularly increasing. It is more depressed than *H. cingulata*, with a greater number of whorls, which increase more slowly.

Casentino.

Var. PINII, Adami.

Subdepressed, reddish corneous, subpellucid, striulate.

Diam. 18–26, alt 8–11 mill. *Verona.*

Var. INCERTA, Adami.

Subdepressed, striate, last whorl subcompressed, yellowish within, perspectively umbilicated. Diam. 24–29, alt 9–12 mill.

Var. CINGULINA, De Betta.

Widely umbilicated, thick, irregularly striate, greyish brown, with a brown band bordered by white; aperture subrotund, very oblique, margins converging; whorls 5½, subplanulate, sensibly increasing.

Klamm.

Var. BIZONA, Rossm.

Small, milky white, with a wide clear brown band under the normal one, aperture more rounded, not so oblique as in the type, margins of peristome more distinct. Diam. 23 mill.

South Tyrol.

Var. KOBELTIANA, Paulucci. Pl. 27, fig. 84.

Similar somewhat to *H. cingulata* above; below with wider umbilicus more circular aperture, last whorl more deflexed above, with chestnut band bordered with white; base greenish chestnut; swollen.

Diam. 25, alt 13 mill.

Apuanian Alps.

Var. MONTANA, Paulucci. Pl. 27, figs. 85, 87.

Identical in color to *H. carrarensis*, but differs in the more regularly increasing whorls, the last much narrower, flatter above, umbilicus larger, aperture smaller, less rounded, more oval, base less swollen, last whorl not so high as in *H. carrarensis.*

Diam. 24, alt 11 mill.

Apuanian Alps.

Var. AGNATA, Paulucci. Pl. 27, fig. 96.

Differs from var. *affinis* in the higher spire, narrower umbilicus and more solid shell. The chestnut band is sometimes lacking leaving a wide white zone encircling the periphery.

Diam. 23, alt 12 mill.

Var. UNICOLOR, Clessin.

Usually small, concolored, bandless; mouth wide, peristome narrowly reflected. Diam. 24 mill.

Southern Tyrol.

Var. ROSSMAESSLERI, Clessin.

Small, dark with peripheral clear zone and the bands one above, the other below, lost in maculations. Diam. 25 mill.

Southern Tyrol.

H. GOBANZI, Frauenfeld. Pl. 26, figs. 69–72.

Moderately umbilicated, solid, closely, acuately costate, whitish, brown banded, the band sometimes obsolete, ribs white, apex blackish corneous, suture deep; whorls about 5, slightly convex, the last depressed, periphery obsoletely angulated, descending in front, base scarcely more convex; aperture flesh color, peristome thinly labiate, acute, expanded above, reflected below, margins approximating.

Diam. 21–25 mill.

Tyrol.

H. TIGRINA, Jan. Pl. 28, figs. 32, 33.

Widely umbilicated, somewhat flattened above, slightly striate, convex below, variegated with brown and white; whorls 5, flattened,

the last suddenly deflected in front, periphery carinate; peristome sublabiate, simple above, reflected below, margins joining.

Diam. 23 mill.

Lombardy.

H. TRIZONA, Ziegler. Pl. 25, figs. 45–47,

Umbilicated, yellowish white, three-banded with chestnut; whorls 5–5½, somewhat flattened, the last descending in front, peristome subsimple, expanded above, reflected below, columellar margin dilated, extremities joining. Diam. 30 mill.

Servia, Roumelia.

It is *H. tricincta*, Mühlf., *H. zonata*, Fér. var.

Var. RUMELICA, Ziegler. Pl. 25, figs. 48, 49.

Smaller, with narrower whorls. Diam. 22 mill.

H. rhodopea and *H. Sanderiana*, Friv. are synonyms.

Var. INFLATA, Bielz. Pl. 25, fig. 50.

Inflated, thin, with narrower umbilicus than the type.

Var. FRAUENFELDI, Zelebor. Pl. 25, fig. 51.

Whitish, with hyaline bands.

Var. BALCANICA, Friv. Pl. 25, figs. 52, 53.

Yellowish green, upper and lower bands grown together here and there uniting with the median zone.

Balkan.

Var. EXIGUA. Pl. 25, figs. 54, 55.

Differs only in its much smaller size from the preceding.

Var. DOBRUDSCHÆ.

Darker than type, with wide umbilicus, and depressed whorls; margins of peristome less approaching. Lower band wide.

Diam. 27, alt. 13 mill.

Roumania.

Unfigured Species.

H. AMATHIA, Bourg. *France.*

H. SIGELA, H. PERFECTA, H. COMPSOPLEURA, Bourg. *Italy.*

H. HEMONICA, Thiesse. *Greece.*

VI, *Group of H. intermedia*, Fér.

H. GLACIALIS, Thomas. Pl. 30, figs. 73–75.

Moderately umbilicated; yellowish, variegated, singly banded with chestnut, plicate-striate above, lightly spirally lineate; whorls 5, somewhat convex, the last scarcely deflected, slightly angulate; peristome white-lipped, upper margin scarcely expanded, basal margin shortly reflected. Diam. 13 mill.

Mts. Tyrol and Northern Italy.

H. AEMULA, Rossm. Pl. 30, fig. 72.

Narrowly umbilicated, rather thin, striate, very slightly, thinly decussated, opaque, white, with a narrow chestnut band; whorls 4½, subplane, the last deflected in front; peristome thin, expanded, scarcely sublabiate, margins joining. Diam. 12 mill.

Tyrol, Northern Italy.

It is *H. Martinatiana*, De Betta, *H. Ambrosi*, Strob., *H. cingulina*, Bas.

H. INTERMEDIA, Fér. Pl. 29, figs. 64–66.

Openly umbilicated, striate, yellowish white, unicolored, or three banded with chestnut, outer bands interrupted; whorls 5, flattened, the last deflected in front; aperture subhorizontal, peristome reflected, margins nearly continuous. Diam. 16 mill.

It is *H. catenulata*, Mühlf. and *H. cornea*, Brum., *H. tetrazona*, Jan, referred here as a variety by Pfeiffer, is an Iberus.

H. PICÆNA, Tiberi. Pl. 33, figs. 71–72.

Umbilicate, depressed, obliquely striate, light corneous, with four subcontinuous bands of pale rufous, spire depressed, apex rufous, glabrous, whorls 5, separated by deep sutures, the last compressed, subangulate at periphery, deflexed anteriorly, subplanulate below; aperture very oblique, subovate, peristome sublabiate with brown; basal margin briefly reflected, columella dilated.

Diam. 20, alt 7½ mill.

Mt. Pizzo di Sivo.

H. ZIEGLERI, Schmidt. Pl. 29. figs. 67–69.

Widely umbilicated, greyish white, interruptedly three-banded, plicately ribbed above; whorls 5, somewhat flattened, the last suddenly deflected in front; peristome labiate, margins nearly continuous, expanded above, reflected below. Diam. 20 mill.

Alps, Carniola.

It is *H. strigata*, var., Cantraine.

H. CANTABRICA, Hidalgo. Pl. 20, fig. 8–10.

Widely umbilicated, thin, scarcely shining, very minutely, irregularly rugosely striate, with very minute, slight impressed punctations, the juvenile with very short hairs, corneous pellucid, opaquely striate and punctate with whitish or yellowish; whorls 5, slightly convex, slowly increasing, periphery obtusely angulated, last whorl subdilated and descending in front, more convex below; aperture brownish corneous, peristome simple, acute, white-lipped within, margins approximating. Diam. 13 mill.

Caldas de Oviedo, Asturia, Spain.

H. SHAUFUSSI, Kobelt. Pl. 20, figs. 11, 12.

Umbilicate, orbicular depressed, solid, shining, lightly striate, whitish, irregularly radiate with corneous, spire slightly elevated, whorls 5, the last rapidly increasing, subangulate, descending at anterior; aperture rotund-lunate, peristome strongly labiate with white, margins converging, the basal slightly dilated.

Diam. 14 mill.

Liebanathal in the Cantabrican Mts.

H. ZONELLA, Pfr. Pl. 48, figs. 92, 93.

Rather narrowly umbilicated, somewhat solid, closely rugosely striate, light brownish, with a median whitish zone, usually chestnut-margined; whorls 5½, slightly convex, the last rounded, scarcely descending in front; peristome simple, margins converging, acute, simple above, shortly reflected below. Diam. 15 mill.

White Mts., Isl. of Crete.

Unfigured Species.

H. TRUTATIANA, Fagot. *Pyrenees.*
H. CHIOPHILA, Bourg. *France.*

VIII, *Group of H. cornea*, Drap.

H. CORNEA, Drap. Pl. 29, figs. 54, 55.

Umbilicated, striulate, whitish corneous above, with a single pale band, light brownish below; whorls 5, scarcely convex, the last suddenly deflected in front; peristome labiate within, angularly reflected, margins approximating. Diam. 17 mill.

France, Pyrenees.

Var. CASTANEA, Rossm. Pl. 29, figs. 56–58.

Chestnut color, without the band. *H. squamatina*, Fér., is a synonym.

H. DESMOULINSI, Farines. Pl. 29, figs. 59, 60.

Moderately umbilicated, rather thin, lightly arcuately striate, not shining, greenish corneous; whorls 5–5½, slightly convex, moderately increasing, the last subcarinated, tumid and suddenly deflected in front, base convex, more shining, peristome white, acute, continuous, superior margin labiate within, inferior margin angulately reflected. Diam. 16 mill.

Eastern Pyrenees.

It is *H. Moulinsii*, Pot. et Mich., *H. cornea*, var. *cyclostoma*, Rossm., *H. acrosticha*, Fischer and *H. Mollerati*, Morelet.

H. MIDDENDORFFI, Gerstfeldt. Pl. 29, figs. 61, 63.

Openly, almost perspectively umbilicated, more or less depressed thin and transparent, closely, distinctly striate, a little shining, yellowish or yellowish white, with a single chestnut band; whorls 6½–7, slightly convex, suture moderately impressed; peristome simple, a little reflected, sublabiate within. Diam. 24 mill.

Amur River.

H. CŒRULANS, Mühlf. Pl. 31, figs. 14–17.

Rather narrowly umbilicated, irregularly rugose, solid, opaque, shining, bluish, brown in the aperture; whorls 5, convex, the last deflected in front; peristome simple, margins subcontinuous, the basal margin labiate, subreflected. Diam. 20 mill.

Croatia.

H. lacticina, Rossm. is a synonym. Brusina enumerates Var. *Hyllica*, Brus., larger, a little elevated, rugosely striated; Var. *depressa*, Zel., moderate size, depressed, smooth; Var. *rugata*, Kucik. and Sandri, elevated, rugose, with a single band; Var. *Bakovicana*, Brus., depressed, smooth, brownish, sub-banded; Var. *Zrmaniæ*, Brus, small, depressed, smooth, sub-banded.

Unfigured Species.

H. SQUAMMATINA, Serres. *France.*
H. CROMBEZI, Milliere. *France.*

Subsection IV, Tacheocampylæa, Pfr. 1877.

H. Raspailii, Payr. Pl. 31, figs. 9, 10.

Covered perforate, brownish yellow, with three chestnut bands, striate, somewhat solid; whorls 4½, flattened, the last subdeflected in front; peristome labiate, expanded above, reflected below.

Diam. 35 mill. *Corsica.*

Var. pilosa, Kobelt. Pl. 31, figs. 11.

Epidermis strong, thickly beset with short hairs. *Corsica.*

H. Brocardiana, Dutailly. Pl. 31, figs. 12, 13.

Imperforate, depressed, sub-roof-like above, convex below, thin, translucent, shining, elegantly striulate, more distinct at the suture, brownish olive color, with three chestnut bands above; whorls 5, slightly convex, regularly increasing, the last large, almost rounded, slightly descending in front, inflated around the umbilical callus; peristome yellowish chestnut color, thickened, slightly expanded, margins approaching, connected by a callus, columellar margin widely reflected, appressed upon the umbilicus Diam. 30 mill.

Mt. Pigno, near Bastia, Corsica.

H. insularis, Crosse and Debeaux. Pl. 32, figs. 20, 21.

Imperforate, very thinly, obliquely striulate, thin, a little shining, translucent, greenish white, with occasional light olivaceous longitudinal lines, suture impressed; whorls 4–4½, planulate, the last rounded, suddenly deflected in front, base more convex; peristome white, shortly reflected, margins converging. Diam. 27 mill.

Near Cenestinum, Corsica.

H. Revelieri, Debeaux, Pl. 32, figs. 22, 24.

Umbilicated, somewhat solid, shining, scarcely convex above, plano-convex below, rugularly spirally striate, brownish yellow or brownish green, with three chestnut bands; whorls 4–5, with deep suture; peristome simple, labiate, margins converging, joined by a thin callus. Diam. 28 mill.

Mt. Renoso, Corsica.

H. Cyrniaca, and *H. omphalophora*, Dutailly, *H. planospira*, Payr, and *H. Raspaili*, var. *umbilicaris*, Moq. Tand. are synonyms.

H. Carotii, Paulucci. Pl. 33, figs. 73, 75.

Umbilicus nearly covered, shell solid, opaque, slightly striulate, olivaceous, three narrow chestnut bands; whorls 4–4½, somewhat convex, the last whorl rapidly increasing, suture distinct, descending

in front and somewhat inflated; peristome scarcely reflected, columellar margin dilated, thickened, extremities joined by a callus.

Diam. 29 mill.

Ins. Sardinia.

Var. VIPERINA, Maltzan. Pl. 45, fig. 33.

Irregularly marked above with yellow maculations. *Dorgali.*

Var. SPECTRUM, Maltzan. Pl. 45, fig. 34.

Unicolored, green, and of light texture, resembling in color the unicolored var. *H. hortensis.*

Var. LAMARMORÆ, Maltzan.

A more conoidal, elevated form than the type, somewhat smaller.

H. GENNARII, Paulucci. Pl. 34, figs. 77, 78.

Imperforate, conoid globose, lightly striate, subopaque olive colored with a narrow castaneous band, bounded above and below by pale brown zones; spire conoidal, apex very large, sutures distinctly impressed, white margined; whorls 4½, regularly increasing, the last much inflated, deeply deflexed anteriorly; aperture oblique, ovate-rotund, lunate bluish within, peristome thin, slightly reflected.

Diam. 32, alt 24 mill.

Ins. Sardinia.

H. MELONII, Maltzan. Pl. 34, figs. 79, 80.

Depressed globose, covered perforate, spire obtuse, conoid apex very obtuse, irregularly striate, trifasciate with brown on an olivaceous ground, suture distinct, white margined, whorls 4, convex, the last inflated, rounded, at aperture suddenly descending, aperture very oblique, rotund ovate, margins converging, columella reflexed and thickened. Diam. 25–29 mill.

Ins. Sardinia.

H. BRENSKEI, Böttger. Pl. 34, figs. 81, 82.

Moderately umbilicated, depressed conic, solid, reddish-corneous, with a supramedian brown band, apparently lying under the epidermis; distinctly striate above, with numerous fine short brown hairs, about 16 to 25 standing upon a square mill.; whorls over 6, convex, with deep sutures; the last dilated, descending anteriorly; aperture oblique, lunate, peristome impinging slightly upon umbilicus.

Diam. 29 mill. *Messena.*

Unfigured Species.

H. ROMAGNOLII, Dutailly. *Corsica.*

H. ACROPACHIA, H. LENELARIA, H. MONEREBIA and H. OUSTEREA, Mabille. *Corsica.*

Subsection V, PSEUDOCAMPYLÆA, Hesse, 1884.

H. CYCLOLABRIS, Desh. Pl. 30, figs. 91, 92.

Moderately, perspectively umbilicated, rather thin, subgranular, and rarely pilose, light corneous, with a brown, pale margined band whorls nearly five, somewhat convex, the last rounded, suddenly deflected in front; peristome slightly labiate, white, continuous, almost solute, expanded above, reflected below. Diam. 22 mill.

Greece.

Var. HYMETTI, Mousson. Pl. 31, figs. 96, 97.

Shell larger, last whorl more transversely dilated, aperture larger, peristome solute. Diam. 27 mill.

Var. ARCADICA, Parr. Pl. 30, fig. 93.

Shell inflated, darker colored.

Var. HELDREICHI, Shuttl. Pl. 31, figs. 98, 99.

Very small with circular mouth and thickly pilose. Diam. 15 mill. *Athens.*

Var. EUBŒA, Parr. Pl. 31, fig. 100.

Spire more planate, peristome continuous, but not solute. Diam. 23 mill. *Mt. Delphi, Greece.*

Var. SPHÆRIOSTOMA, Bourg. Pl. 31, figs. 1–5.

Perviously umbilicated, depressed, striulate, diaphanous, whitish yellow, with two or three chestnut bands; whorls 5½, a little convex, the last suddenly deflected in front.

Thessaly.

H. lysistoma, Shuttlw. (figs. 1, 2.) is a synonym.

H. GRELLOISI, Bourg. Pl. 31, figs. 6–8.

Perviously umbilicated, depressed, fragile, diaphanous, very elegantly radiately striulate, whitish corneous; whorls 6, the last obsoletely angulated, descending in front; peristome white, thickened within, a little reflected, margins approximating. Diam. 16 mill.

Grecian Archipelago.

H. Noverca, Frivaldszky. Pl. 32, figs. 37, 38.

Moderately umbilicated, rather thin, diaphanous, obliquely rugosely striate, fulvous, with a narrow chestnut band above and a white one upon the periphery, suture white margined; whorls 5½, scarcely convex, the last one shortly deflected in front, periphery very obsoletely angulated; peristome white-lipped within, margins somewhat approaching, expanded above, reflected below.

Diam. 14·5 mill.

Ins. Crete.

H. pellita, Ferussac. Pl. 32, figs. 28, 29.

Perforate, fulvous with a white, usually chestnut-margined band, costulate-striate, with rigid, erect hairs; whorls 5, somewhat convex, the last deflected in front; peristome acute, white-lipped within, margins approximating, joined by a thin callus. Diam. 15 mill.

Morca, Syra, Isl. of Rhodes.

Var. Kreglingeri, Zeleb. Pl. 32, fig. 32.

A little larger, whorls rounded, spire more elate.

Var. graphicotera, Bourg. Pl. 32, figs. 30, 31.

Sharply obliquely sculptured, elegantly minutely decussated, whitish brown, with a white, fulvous margined band; whorls 6½, somewhat convex; the last suddenly deflected in front.

Ins. Milos.

H. Naxiana, Férussac. Pl. 32, figs. 33, 34.

Narrowly umbilicated, obliquely striate, brownish, strigate with whitish, and with a white, chestnut-margined band, spire subelate; whorls 5, somewhat flattened, the last deflected and subconstricted in front; peristome white-lipped within, reflected, margins approximating. Diam. 14 mill.

Ins. Naxos, Crete.

A variety has a white surface, with three chestnut bands.

Var. Westerlundi, Blanc. Pl. 32, figs. 35, 36.

Moderately umbilicated, rather thin, pellucid, obliquely densely rugosely striate, slightly granular, light fulvous or brownish corneous, with a whitish peripheral band and a narrower chestnut band above it, sometimes with a less distinct inferior band, and a third at

the suture; whorls 6, suture irregularly white margined, last whorl deflected in front; periphery expanded, margins approaching, united by a callus. Diam. 22–23 mill.

Ins. Crete.

It is *H. sanctorum*, Blanc, Mss.

H. LECTA, Férussac. Pl. 32, fig. 39.

Narrowly umbilicated, thin, obliquely closely costate-plicate, white, unicolored, or with three narrow chestnut bands; whorls 5, flattened, the base convex, deflected in front; peristome white-lipped within, shortly expanded, the approximating margins joined by a callus. Diam. 17 mill.

Ins. Theodoro, near Crete.

H. SUBLECTA, Maltzan. Pl. 32, figs. 40–42.

Narrowly umbilicated, globose depressed, regularly obliquely costulate striate, solid, white, encircled by 3 brown bands; spire slightly elevated, whorls 5½, slowly increasing, the last rounded, subinflated, descending anteriorly; aperture rotund lunar, peristome acute, labiate, margins converging, reflected below, partially covering the umbilicus. Diam. 18, alt. 12 mill.

Ins. Crete.

H. ZONELLA, Spratt. *Unfigured.* *Greece.*

Subsection VI, ELONA, H. and A. Adams, 1855.

H. QUIMPERIANA, Férussac. Pl. 32, figs. 25–27.

Narrowly umbilicated, striate, thin, diaphanous, olivaceous corneous, with irregular yellowish radiating strigations, spire slightly concave; whorls 5, convex, the last inflated; peristome acute, reflected, white-lipped within, margins distant. Diam. 26 mill.

Brittany, Spain.

H. Corisopitensis, Desh., and *H. Kermorvani*, Coll., are synonyms.

Subsection VII, CHILOTREMA, Leach, 1820.

H. LAPICIDA, Linn. Pl. 31, figs. 18, 19.

Openly umbilicated, very minutely granulated, yellow corneous, maculated with brown; whorls 5, flatly convex, the last suddenly

deflected in front, periphery acutely carinated; aperture horizontal, peristome continuous, solute, sublabiate, columellar margin reflected.

Diam. 17–20 mill.

Middle and Northern Europe, Madeira.

H. affinis, Gmel., *H. acuta*, Da Costa, *H. rhenana*, Hartm., *H. explanata*, Schranck, *H. Lecoquii*, Paton, *H. mamillata*, Risso, and perhaps *H. albella*, Linn. (= juv.), are synonyms.

Unfigured Species.

H. ANDORRICA, Bourg. *Pyrenees.*

Section III, ARIONTA, Leach, 1820.

A. *European Species.*

H. ARBUSTORUM, Linn. Pl. 32, figs. 43, 44.

Subcovered perforate, rather thin, shining, very minutely spirally striate, longitudinally subrugosely striate, striæ stronger at the suture, brown, spotted with straw color, usually with a chestnut band; whorls 6, convex, the last scarcely deflected in front; peristome white-lipped, upper margin expanded, basal margin reflected.

Diam. 24 mill.

Middle and Western Europe.

H. Gothica, Linn. and *H. unifasciata*, Da Costa are synonyms; *H. turgidula*, Wood is a scalariform monstrosity. Extends from the valleys to an elevation of 8600 feet.

Var. PICEA, Ziegler. Pl. 32, fig. 45.

Very thin, papyraceous, olive or chestnut, unicolored, or with a band, rugosely plicate. Diam. 20 mill.

H. Wittmanni, Zawadsky is a synonym.

Var. JETSCHINI, Kobelt. Pl. 33, fig. 51.

Nearly unicolored, very rarely here and there spotted with yellow, thin, translucent.

Var. DORIÆ, Paulucci.

Deep uniform olivaceous green, without spots, sometimes with a faint band.

Mt. Barone, Piedmont.

Var. XATARTII, Far. Pl. 32, figs. 49, 50.

Solid, greenish yellow, brownish below, umbilicus moderate, subobsolete. Diam. 18 mill.

H. Canigonensis, Boubé is a synonym.

Var. CAMPRODUNICA, Kobelt. Pl. 33, fig. 76.

Solid, depressed, small distinctly costulate-striate, yellowish brown, with a few yellowish maculations, and a superior brown band, last whorl scarcely descending or dilated, lip almost reflected, with white callus within the margin, columellar margin almost covering the umbilicus. Diam. 17 mill.

Spanish Pyrenees.

Var. RUDIS, Megerle. Pl. 32, fig. 46.

Smaller, umbilicated, globosely depressed, spire somewhat flattened, maculated with yellow in transverse lines, epidermis rugosely plicate. Diam. 21 mill.

Alps of Tyrol; Scandinavia.

Var. REPELLINI, Charp.

Depressed, thin, pellucid, pale colored. Diam. 23, alt. 14 mill.

Italy.

Var. ALPESTRIS, Ziegler. Pl. 32, figs. 47, 48.

Smaller, solid, yellowish, single banded. Diam. 10 mill.

H. subalpina, Hartm. Ms. is a synonym.

Var. CONOIDEA, West.

Large, conical, subperforate, subcostulate, with a single, rather broad band. Diam. 23–24, alt. 25–26 mill.

Var. CALCAREA, Hogb.

Thick, chalky, solid, dark chestnut color, with yellowish maculations, dark purple in the aperture. Diam. 22–25 mill.

Var. EXCELSA, Clessin.

Very large, thick, normally colored. Diam. 30 mill.

Roumania.

H. AETHIOPS, Bielz. Pl. 33, figs. 52, 53.

Perforate, very thin, irregularly plicately striate, shining, blackish- or brownish-olivaceous; whorls 4½, somewhat convex, the last not descending in front; peristome slightly white-lipped, a little expanded, margins scarcely converging. Diam. 18 mill.

High mountains in Transylvania.

H. Styriaca, Frauenfeld. Pl. 33, figs. 54, 55.

Moderately umbilicated, with rather rough incremental striæ, and slight spiral lines, sometimes obsolete, dark corneous brown, here and there darker, with radiating strigations and maculations of light yellowish, with a superior dark brown spiral band, whorls 5½, aperture large, white-lipped, a little inclined above, dilated below.

Diam. 25·5, alt. 12·5 mill.

Styria.

Probably a flattened, umbilicated variety of *H. arbustorum.*

Unfigured Species.

H. Thamnivaga, Mabille. *Plombieres.*
H. Themita, Mabille. *Hungary.*
H. Fagoti, Bourg. *France.*

B. *California Species.*

H. Stearnsiana, Gabb. Pl. 33, fig. 56.

Narrowly umbilicated, solid, with fine oblique incremental striæ, sometimes crossed by slight revolving lines; whitish, with crowded ash-colored spots, grouped below into revolving series, and a superior brown band; whorls 5, rather convex; aperture obliquely semicircular, peristome simple, acute, columellar margin expanded.

Diam. 22 mill.

Lower California, and at San. Diego, Cal.

H. Kelletti, Forbes. Pl. 33, fig. 57.

Narrowly umbilicated, or imperforate (in adults) thin, granulated, obliquely striated, with slight impressed spiral lines, fulvous, with brownish blotches and a superior band; whorls 6, rather convex, the last with a white peripheral band, and basally inflated; aperture reddish and banded within, peristome thin, scarcely reflected.

Diam. 22 mill.

San Diego, and Catalina Isl., California.

H. Californiensis, Lea. Pl. 33, fig. 58.

Subperforate, subglobular, thin and transparent, shining, delicately indented and granulated, faintly, regularly striated, yellowish horn color, minutely pale spotted, with a superior chestnut, light margined band; whorls 5, convexly rounded, base ventricose; peristome thickened within, slightly expanded, columellar margin nearly covering the umbilicus. Diam. 19 mill.

Monterey, California.

The above is a rare species, more nearly allied than the others to the European *H. arbustorum*. Dr. J. G. Cooper, and following him Mr. W. G. Binney refer to Californiensis as varieties, *H. Nicklin-iana, H. ramentosa, H. reticulata, H. Diabloensis*, etc., all of which appear to me to belong to an entirely different group, and I have so treated them (see pp. 73, 74.). *H. vincta*, Val. (figured but not described) is a synonym.

Section IV, Eurystoma, Albers, 1850.

H. vittata, Müller. Pl. 33, figs. 59, 60, 62.

Perforate, striated, shining, whitish, variously banded with brown and yellow, apex black; whorls 5, somewhat planulate, the last with convex base, descending in front; aperture dark brown, peristome labiate, expanded, margins joining by a callus, columellar dilated, partly covering the umbilicus. Diam. 28 mill.

Ceylon, Malabar, Coromandel.

H. zonula, Wood (fig. 62) is a synonym.

Var. Spinolæ, Villa. Pl. 33, fig. 61.

Smaller, white, unicolored, apex bluish brown. Diam. 22 mill.

Continuation of Tryon's Monograph of the Helicidæ, by H. A. Pilsbry.

Group X, Pentatænia, A. Schmidt.

Shell globose or somewhat depressed, of moderate or large size, imperforate or moderately umbilicate, usually with five revolving bands; animal provided with a dart; jaw moderately arched, and, except in *Allognathus*, with strong separated ribs, usually few in number, and grouped on its median portion; the central teeth have a strong middle cusp; the side cusps are usually obsolete; the laterals are similar, but asymmetrical; the marginal teeth have several short cusps.

I follow Kobelt in grouping the following subgenera under the general head of Pentatænia. The number of bands in nearly every species of the group is normally five, but frequently is less, through coalescence or absence of bands. This pentatæniate character will separate the group from the preceding, *Arionta*, which has one or three bands, and from *Rhagada Xerophila*, etc., which have numerous bands. The group is European in distribution, and comprises the largest and most characteristic helices of that region.

Section I, TACHEA Leach, 1820.

Imperforate, globose-conic or depressed, smooth and shining, highly colored, banded with a contrasting shade, last whorl ventricose, slightly deflected at aperture; peristome expanded, labiate, columellar lip callous, gibbous. Conspicuous garden-snails of Europe, introduced by commerce into America, Australia, etc. type, *H. nemoralis L.*

Section II, EREMINA, Pfeiffer, 1855.

Depressed globose, flattened above, convex below, rudely striate, cretaceous, solid, white, or marked with dull reddish. Deserts of Egypt and Syria. Type, *H. desertorum* Forsk.

Section III, MACULARIA Albers, 1850.

Imperforate, globose or depressed, whorls 4 or 5, the last usually strongly deflexed at aperture; peristome expanded, callous within, the columellar margin dilated and appressed, callous and sometimes dentate within. Large species, characteristic of southern Europe, especially Spain, and northern Africa. Type, *H. vermiculata* Müll.

Section IV, ALLOGNATHUS Pilsbry, 1888.

Imperforate, globose thin, whorls rapidly increasing, the last large, convex below; aperture rotund-lunate, rounded below; peristome slightly expanded; jaw arcuate, smooth, without median projection, striæ or ribs. Type *H. grateloupi* Graells. *Ins. Majorca.*

Section V, HEMICYCLA Swainson, 1840.

Shell covered perforate, globosely depressed, rugosely sculptured, malleated; aperture very oblique, lunate-oval, peristome reflected, thickened within, upper and lower margins sub-parallel, the latter often toothed. Type, *H. plicaria* Lam. Shells resembling both Macularia and Leptaxis; distribution, *Canary and Cape Verd Is.*

Section VI, PLEBICULA Lowe, 1852.

Umbilicate or imperforate, subglobose, striate, hispid, granulate, aperture rounded, peristome simple, margins approaching, subreflexed on columellar margins. Type, *H. punctulata* Sowb.

Madeira Is.

Section VII. LEPTAXIS Lowe, 1852.

Thin, umbilicate or imperforate, globose or depressed, striate or wrinkled, periphery sometimes keeled, base inflated; columella

entering, more or less dilated, peristome slightly expanded, extremities converging; dark brown, unicolored, or obscurely banded, Azores, Madeira Is. etc. Type, *H. undata*, Lowe.

Section VIII, Iberus, Montfort, 1810.

Narrowly umbilicate or imperforate, globose, or depressed, periphery sometimes sharply keeled, whitish, obsoletely fasciate, more or less rugose, whorls 4–5, the last anteriorly descending; aperture very oblique, peristome expanded, labiate, reflexed at columellar margin. Type, *H. muralis*, Müll. Characteristic of middle and southern Italy and Sicily, but found throughout southern Europe.

Section IX, Pomatia Beck, 1837.

Large, globose, striate, rather thin, imperforate or narrowly perforate, unicolored or five banded, whorls convex, rapidly increasing, last large, ventricose, descending anteriorly; aperture lunate-orbicular, peristome expanded or sharp, callous within, columellar margin reflected. Type *H. pomatia* L. Distribution, Europe, Western Asia and Northern Africa. Introduced by commerce into America etc.

Section I, Tachea Leach, 1820.

This group comprises the most abundant and conspicuous European snails. Several species have been introduced by commerce into distant countries.

The shells are bright colored and banded, the color pattern very variable.

Cepaea Held, 1837, and *Archelix* Albers 1850 are synonyms.

The jaw in Tachea (Pl. 35, fig. 15,) is stout, arched, with strong ribs, few in number, denticulating either margin. The dentition is characterized by the obsolecence of side cusps to the central and adjacent lateral teeth; marginal teeth with several cusps.

H. nemoralis, Linn. Pl. 34, figs. 94–96, Pl. 35, fig. 97.

Imperforate, subglobose conic, irregularly striate, yellow, with five sharply defined deep brown bands, sometimes coalescent, or unicolored white, pink, yellow or bright corneous; whorls 5, the last slightly descending in front; aperture rotund-lunar, peristome expanded,

labiate, dark brown, its extremities connected by a callus of the same color; columella straight, flattened, callous within.

Diam. 20–25 mill.

Western, Middle, and Northern Europe.

The synonymy includes *H. cincta*, *H. quinquefasciata*, Shepp., *H. etrusca*, Ziegl, *H. imperfecta* and *H. olivacea*, Risso, *H. turturum*, Stew.

In the arrangement of bands this form, like all species of *Tachea*, is interminably varied.

Var. CONOIDEA, Clessin.

Spire conoid, elevated. Diam. 22, alt 18 mill. *Bavaria.*

Var. ERJAVECI, Kobelt. Pl. 35, fig. 98.

Broadly two banded, the bands broken into streaks in the direction of the striæ. *Görz.*

Var. LUCIFUGA, Ziegl.

Large, solid, thick shelled. Diam. 30 mill. *Italy.*

Synonyms: var. *appennina*, Stab., *H. genuensis*, Porro.

Varieties *albolabiata* and *roseolabiata* are sufficiently described by their names. Var. *libellula*, Risso is diaphanous, green, peristome reddish violet. Var. *creticola*. Mörch, is a large heavy form of 30 mill. diam., from Sweden. Var. *porrecta*, Westerlund from Sweden, in which the suture does not descend at aperture; etc., etc.

H. HORTENSIS, Müller. Pl. 35, figs. 99, 1.

Similar in form to *H. nemoralis;* somewhat smaller; peristome white, its ends connected by a light white callus on parietal wall; bands five, subject to the same mutations as those of *H. nemoralis.*

Northern and Central Europe, Westward to Pyrenees; introduced into Eastern U. S. and Canada.

H. ludoviciana d'Aumont, and *H. subglobosa*, Binn. are synonyms.

Var. TROCHOIDEA, Clessin. Diam. 19, alt 17 mill.

Var. PERFORATA, Westerlund.

Yellow, five fasciate, deeply perforate. *Gotland.*

Var. ARENICOLA, Macq.

Thin pellucid, pale yellow, white banded. *Scotland.*

Var. HYBRIDA, Poir. Pl. 35, fig. 100.

Peristome and parietal callus pale reddish.

H. sauveuri, Colb. is synonymous.

The *hortensis* is considered by many conchologists to be a variety of *H. nemoralis*, with which the Var. *hybrida* connects it.

H. VINDOBONENSIS, C. Pfr. Pl. 34, figs. 89–93.

Imperforate, globose conic, heavily striate, whitish or yellowish, with five unbroken deep brown bands, the upper two usually narrow; whorls 5, the last large, convex, descending anteriorly; aperture widely rotund-lunar, peristome brown, expanded, labiate, appressed and flattened below, bearing on columella a white tipped callus. Diam. 20–25 mill.

Central and Eastern Europe; Caucasus.

The synonymy includes *H. austriaca*, Mühl., *mutabilis* Hartm. *arvensis*, Kryn., and *subaustriaca*, Bourg.

The bands are sometimes coalescent, but are usually more stable than in other species of *Tachea*.

Var. EXPALLESCENS, Ziegl. Pl. 34, fig. 90, 91.

Bands obsolete, pale brown or wanting.

Var. MINOR, Rossm. Pl. 34, fig. 93.

Small, globose; altitude nearly equal to diameter.

H. ATROLABIATA, Krynicki. Pl. 34, fig. 83.

Large, depressed globose, imperforate, solid, rudely and irregularly striate, somewhat malleate; epidermis thin, yellowish, with one to three deep, brown revolving bands; spire conic, apex obtuse, whorls 5 to 6, the last rounded, descending anteriorly; aperture widely lunar, peristome deep brown, widely reflected and labiate, appressed at umbilical region, margins joined by a dark callus, columellar margin flattened, wide, thickened near the middle. Diam. 40 mill.

Caucasus.

H. calligera, and var. *repanda*, Dubois, and var. *decussata*, Böttg. are synonyms.

Var. STAUROPOLITANA, A. Schmidt. Pl. 34, fig. 86.

More elevated, with more oblique aperture; roughly malleate, and conspicuously fasciate. Diam. 35, alt. 21–25 mill.

Var. LENKORANEA, Mousson. Pl. 34, fig. 85.

Small, depressed globose, columellar scarcely dentate, fascia subinterrupted; sculpture rough.

Southern Shore, Caspian Sea.

Var. PALLASI, Dubois. Pl. 34, fig. 84.

Radiating streaks of brown; no bands.

Imeretia.

Var. NEMORALOIDES, Mart. Pl. 34, fig. 87.

Small, globose, weakly striate, one or two fasciate.

Diam. 30 mill. *Georgia.*

H. SYLVATICA, Drap. Pl. 35, figs. 4–7, 15.

Imperforate, depressed globose, yellowish white, striate, five fasciate, the bands much interrupted, broken into maculations, whorls 5, last slightly descending; aperture oblique, widely lunate, peristome expanded, labiate, light brown, slightly thickened on columellar margin, and expanded over the umbilicus.

France, Switzerland.

The median bands are less maculated than those above and below. Synonyms are *H. signata* var. *a*, Fér., and *H. mutabilis*, Hartm.

Var. MONTANA, Studer. Pl. 35, fig. 2.

More conic; whorls more convex, with a dentiform callus on columellar margin of peristome.

Switzerland.

Var. EXIMIA, Dup.

Larger, bands confluent. Diam. 24 mill.

Dauphiny.

Var. ALPICOLA, Fér.

Smaller, more convex and inflated; heavily striate, deeply colored.

Var. RHENANA, Kobelt. Pl. 35, fig. 9.

White, maculated bands of pale brown; no continuous bands.

Upper Rhine Valley.

H. COQUANDI, Morelet. Pl. 35, figs. 12–14.

Imperforate, globose depressed, slightly convex below; finely striate, yellowish brown or rosy, variously fasciate, whorls 5½, the last deflexed anteriorly, aperture oval, peristome labiate, expanded, slightly reflexed below, columellar margin dilated, rose colored, covering umbilical region. Diam. 34 mill.

Morocco, Southern Spain.

H. AIMOPHILA, Bourgnignat. Pl. 34, fig. 88.

Globose, subperforate, solid, chalky white, irregularly striate, apex obtuse, sutures impressed, aperture oblong lunate, peristome simple, acute, columella reflexed, almost covering umbilicus.

Diam. 25, alt. 23 mill.

Asia Minor.

Var. TCHIHATCHEFFI, Kobelt. Pl. 35, fig. 17.

Umbilicus wider; conspicuously five fasciate.

Biledschik.

Var. AIMOPHILOPSIS, Villeserre, *Unfigured* *Asia Minor.*

It is similar to *aimophila*, but imperforate.

H. GIBBOSULA, Desh. Pl. 35, fig. 3.

Globose, irregularly striate, white, with three unequal bands, spire short, conic, obtuse; whorls 5, narrow, convex, the last large, convex, imperforate; base gibbous; aperture small, semilunar, lip slightly thickened, wide below. Diam. 17, alt. 16 mill.

Habitat unknown.

I know nothing of the real position of this species or of the next. It may be identical with some of the preceding, or possibly belonging to a wholly different group.

H. FILOSA, Desh. Pl. 35, fig. 18.

Imperforate, subglobose, smooth, yellowish, encircled by narrow dark bands, which are continued upon the peristome; spire short, apex obtuse, reddish; whorls 5, slightly convex; aperture rotund semilunar, peristome labiate, dilated, white with purplish spots.

Diam. 30, alt. 25 mill.

Habitat unknown.

Like *vindobonensis*, but in that species the bands are not continued to the margin of lip.

H. LITTUREA, Pfr. Pl. 35, fig. 16.

Imperforate, turbinate, semiglobose, solid, striate, minutely rugose, malleate, shining, pinkish, with revolving series of reddish markings; spire depressed turbinate, apex somewhat acute, whorls 5, slightly convex, the last scarcely descending, with rounded periphery, encircled by chestnut tessellated bands; base convex; aperture rotund lunar, peristome simple, right margin expanded, columellar subcallous. Diam. 23, alt. 15 mill.

Habitat unknown.

Perhaps is a form of *H. sylvatica*.

Section II, EREMINA, Pfr. 1855.

Desert snails of North-east Africa and Syria, with essentially the same structure as *Tachea*, but, like all desert forms, thick, heavy and calcareous. The jaw is slightly arcuate, with a few strong ribs on its central portion. Teeth, as is usual in the Pentatænia, lacking side cusps; central cusp long as the base. *Erinna*, Mörch 1865 and *Eremophila*, Kobelt 1871, are synonyms.

H. DESERTORUM, Forskal. Pl. 35, figs. 19–23; Pl. 46, fig. 63.

Subcovered umbilicate, rather thick, subglobose, depressed above, tumid below, irregularly striate, chalky white unicolored, or with zones or radiating streaks of reddish brown; whorls 4½, the last large, scarcely descending anteriorly, aperture widely lunate, subangular below; peristome simple, obtuse or somewhat expanded, dilated partially over umbilicus. Diam. 30 mill.

Egypt, Syria, Palestine.

H. maculosa, Born, *H. rhodia*, Chem., *H. irregularis* and *H. nicæensis*, Fér., *H. arabica*, Roth., *H. forskalii*, Ehr., *H. psammitus*, and *H. gemmellarii*, Arad. and Mag. are synonyms.

Var. HASSELQUISTI, Ehrenb. Pl. 36, fig. 24.

White, inflated, irregularly rugose, striate, aperture dark within.

Var. HEMPRICHTII, Ehrenb. Pl. 36, fig. 25.

More inflated, mouth rounder, peristome expanded and much thickened, double, continued beyond the expansion; columella with a shining white callus. The form called *H. chilembia* by Bourguignat represents the extreme development of this variety.

H. DILLWYNIANA, Pfr. Pl. 36, figs. 29–30.

Umbilicate, depressed, solid, irregularly rugose, and lightly malleate, chalky, shining, spire nearly flat, apex prominent, brown; whorls 4½, the last rounded, shortly deflexed in front, base inflated, umbilicus narrow; aperture very oblique, wide lunate, white within; peristome acute, thickened within, reflexed at base.

Diam. 31, alt. 14 mill.

Habitat unknown.

Said by Kobelt to be an abnormal *H. desertorum.*

H. DESERTELLA, Jickeli. Pl. 36, figs. 26–28.

Covered perforate, depressed globose, solid, lightly striate, white, unicolored or trifasciate, maculate above; spire depressed conic, whorls 4½, inflated, rapidly increasing, the last rounded, descending

in front, aperture oblique, rounded lunar, peristome recurved, labiate, margins converging. Diam. 22, alt. 16 mill.

Abyssinia.

H. DUROI, Hidalgo. Pl. 45, figs. 38–40.

Imperforate or umbilicate, depressed globose, solid, somewhat shining, rugulose malleate, longitudinally striate, white with four rufous bands, spire obtuse, slightly convex, or depressed, whorls 5, scarcely convex, regularly increasing, the last twice as wide as penultimate, smoother below, strongly deflexed anteriorly; aperture transverse, white, shining; peristome widely reflexed, labiate, arcuate above, subhorizontal below with a more or less developed wide callus, adnate to body. Diam. 35, alt. 19 mill.

Morocco.

Has much the appearance of *Macularia*, but said by Kobelt to be an *Eremina*.

Section III, MACULARIA, Albers, 1850.

A group of large species, characteristic of Southern Europe and Northern Africa. They are related on one hand to *Tachea*, through such species as *H. splendida*, and on the other to the insular groups *Hemicycla* and *Leptaxis*. The Italian subgenus *Iberus* is also connected by nearly intermediate forms with the depressed Macularia. The central teeth lack lateral cusps; and the jaw, as in *Tachea* etc., is moderately arched, and bears a few strong, separated ribs.

Otala, Moq-Tand. 1855 is a synonym.

H. VERMICULATA, Müller. Pl. 37, figs. 54–57.

Imperforate, globose-depressed, yellowish or dirty white, with five brown bands, the upper one, or sometimes all broken into irregular maculations; surface sculptured with numerous minute vermiform white anastomosing wrinkles; whorls 5, the last descending anteriorly; aperture very oblique, broadly lunate; peristome white, labiate and widely reflected, thickened on columellar margin.

Diam. 30–35 mill.

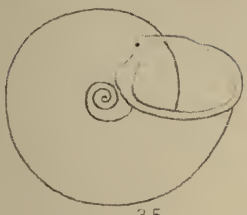
Southern Europe, Northern Africa.

A common species, variable in color somewhat. It is Hartmann's *H. lactea*, *H. muraloides*, Chier. and *H. thalassina*, Porro.

Var. SAHARICA, Kobelt. Pl. 37, fig. 59.

A small, thick shelled form.

Southern Algiers.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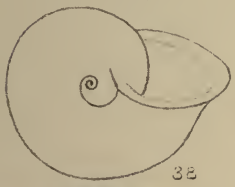
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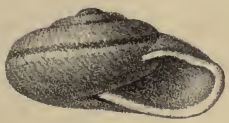
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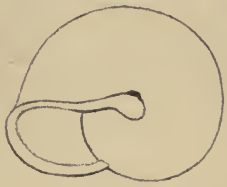
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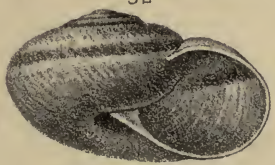
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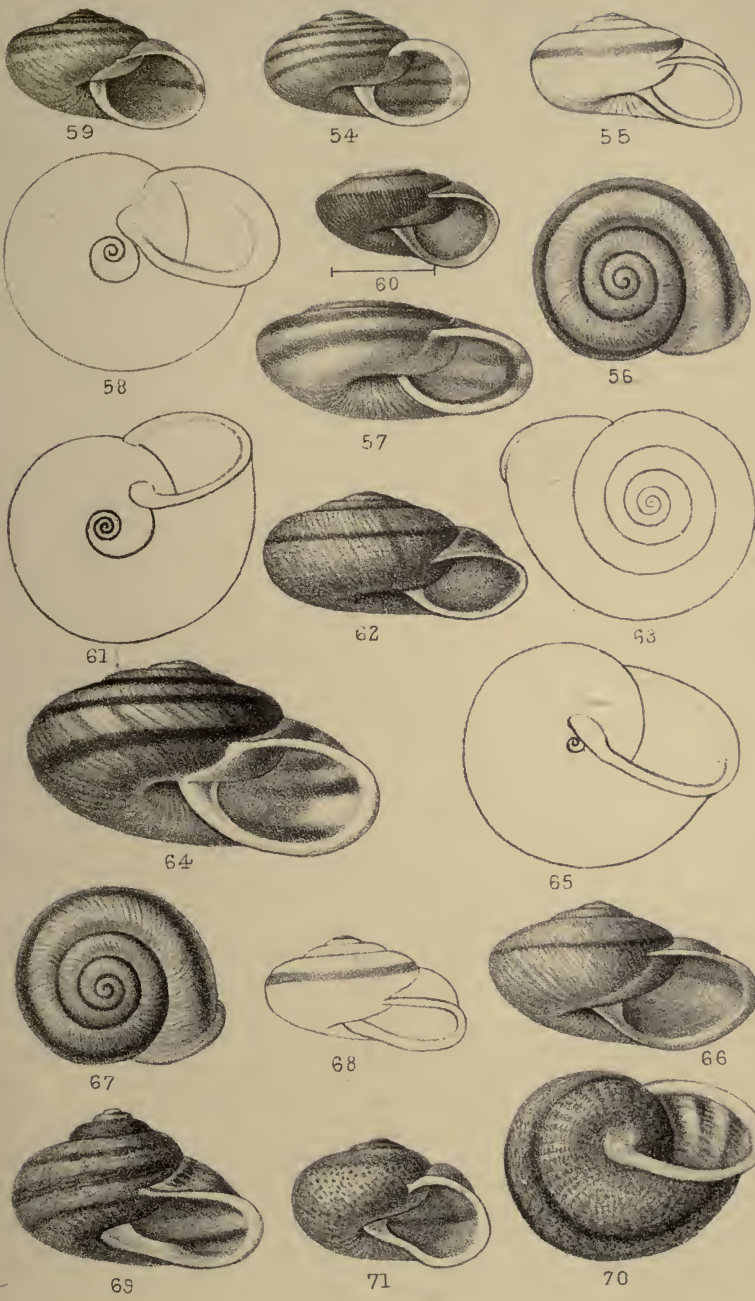
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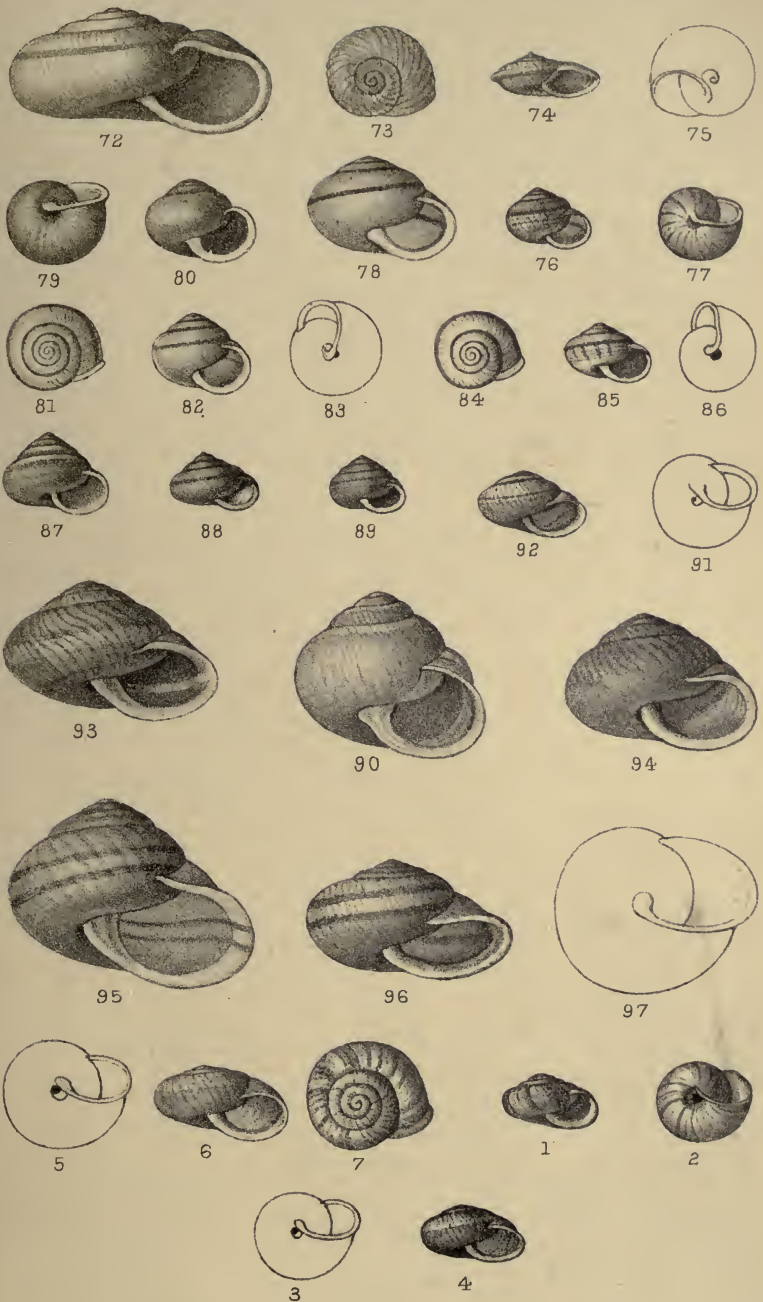
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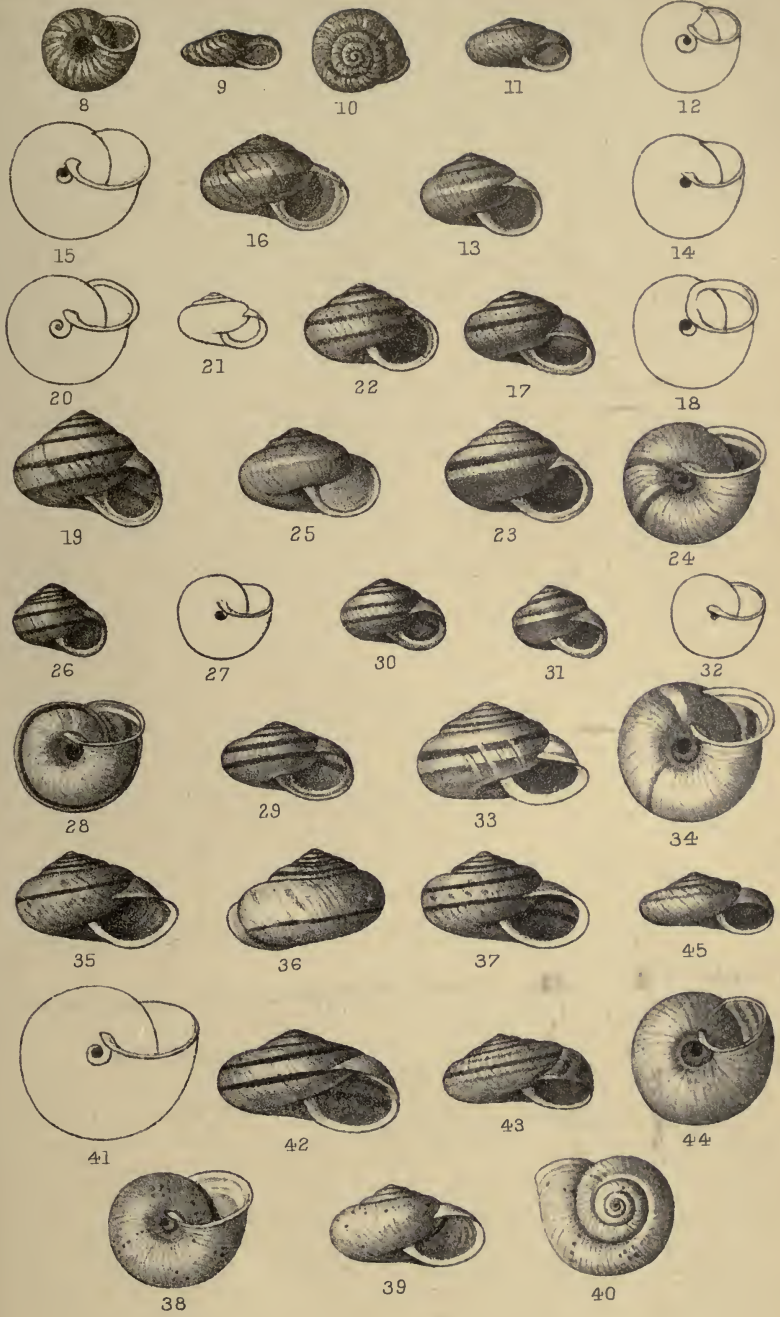
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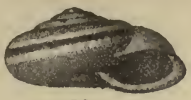
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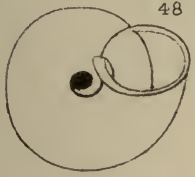
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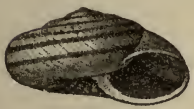
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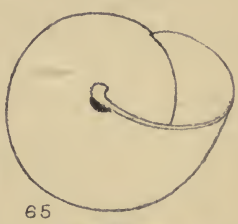
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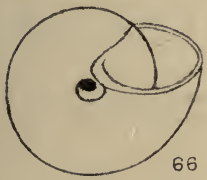
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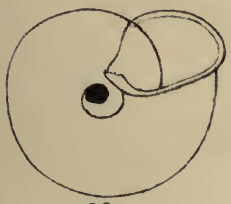
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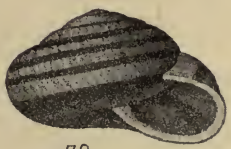
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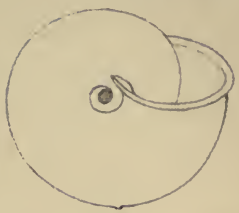
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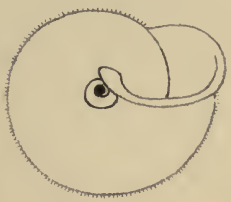
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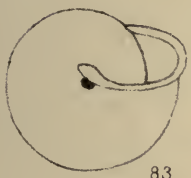
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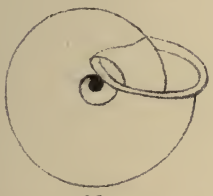
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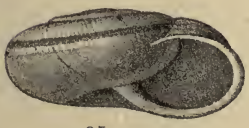
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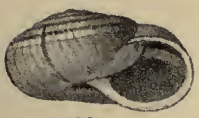
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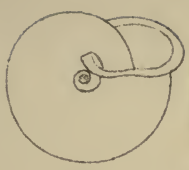
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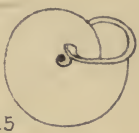
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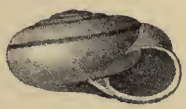
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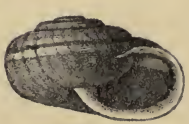
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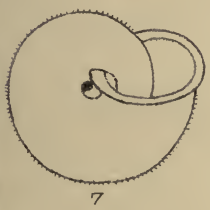
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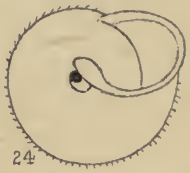
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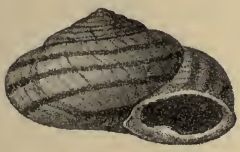
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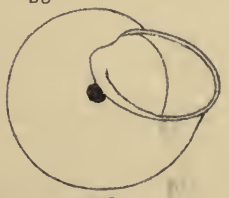
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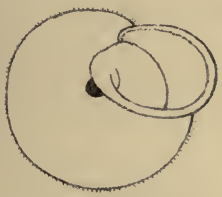
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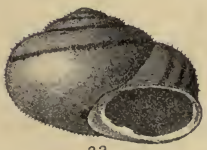
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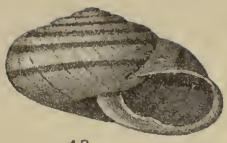
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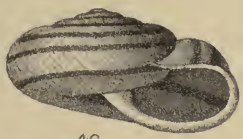
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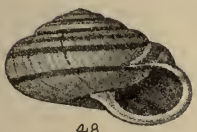
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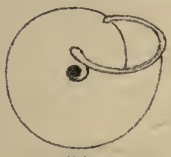
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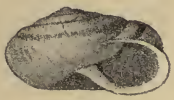
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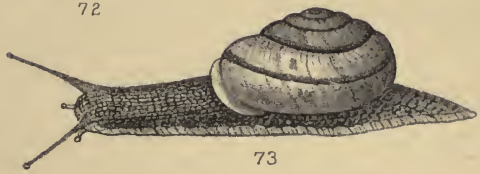
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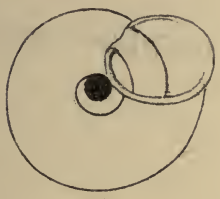
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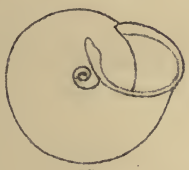
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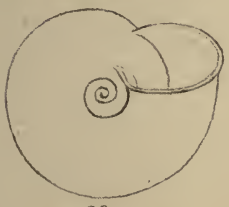
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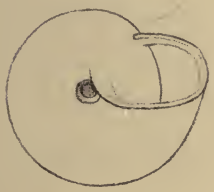
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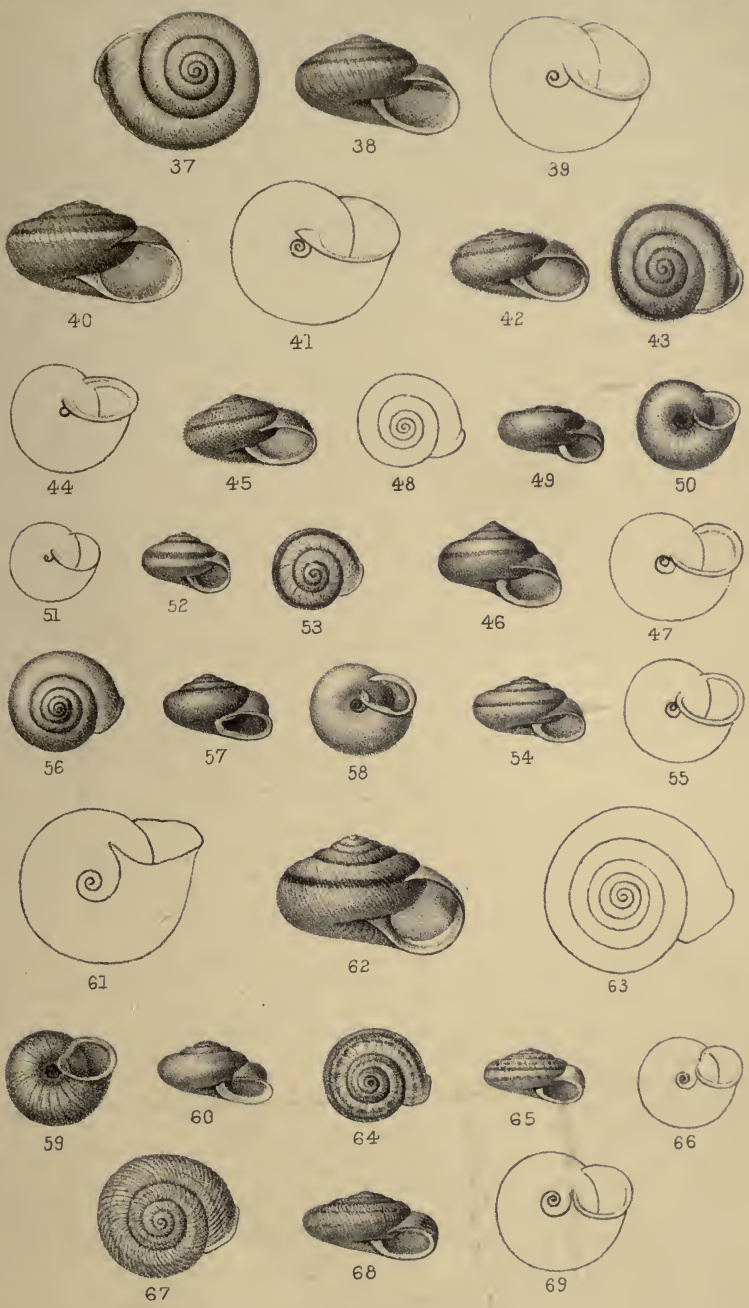
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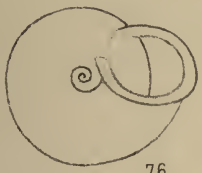
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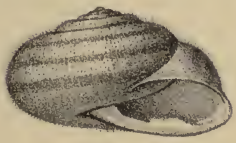
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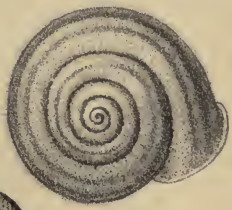
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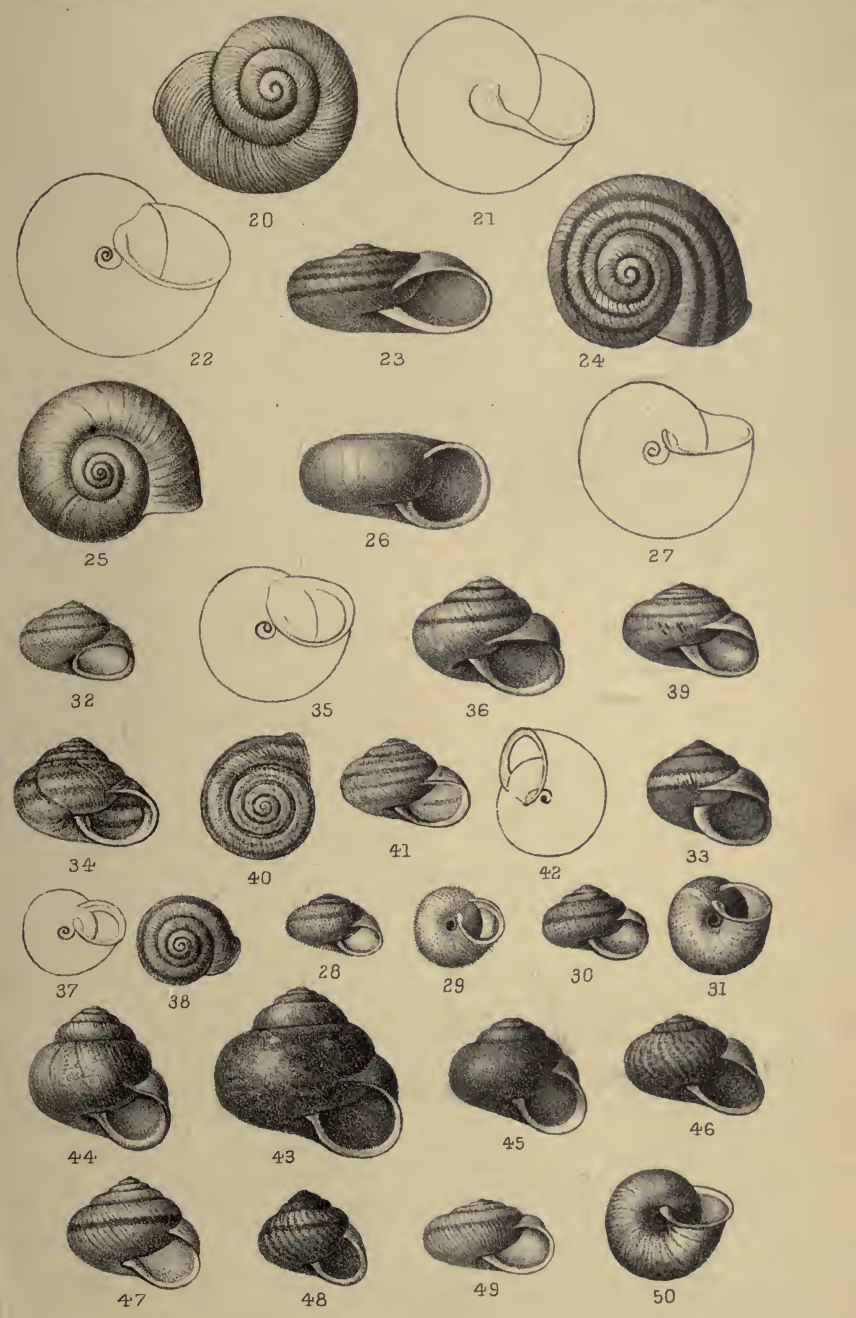
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Var. LINUSÆ Calcara. Pl. 37, fig. 58.

Smaller than type, with more globose and thicker shell and larger aperture.

Ins. Linosa, near Malta.

H. linuisiana Benoit is the same.

Var. SUBANGULATA Issel.

Shell smaller, more solid, aperture subangulate. *Malta.*

Letourneux and Bourguignat describe but do not figure vars. *minuta* and *pelagosana* from Tunis.

H. PUNICA Morelet. Pl. 40, figs. 6–9.

Imperforate, globosely depressed, transversely dilated, lightly striate, with decussating revolving striæ, white, with four subequal brown bands; spire conoid, whorls 5, slightly convex, regularly increasing, the last rounded, deflexed at aperture; aperture very oblique, truncate-oblong, showing the bands within; peristome narrowly reflected, slightly labiate, widened on columella, brownish.

Diam. 31, alt. 20 mill.

Constantine, Algiers.

H. CONSTANTINÆ Forbes. Pl. 37, figs. 60–62.

Imperforate, subglobose, striatulate, shining, whitish, five-banded, bands brown, sometimes obselete, whorls 5, convex, the last deflected anteriorly; aperture rounded-lunate, peristome expanded, sublabiate, columella margin with a heavy subdentate callus. Diam. 27 mill.

North Africa.

H. cirtæ Terver is a synonym.

Var. FLEURATI Bourg. Pl. 37, fig. 66.

Substance of shell calcareous; form more globular; whorls less rapidly increasing.

Tunis.

H. BOGHARIENSIS Debeaux. Pl. 39, figs. 1–3.

Imperforate, more or less depressed globose, typically thin shelled, but sometimes rather heavy, with fine incremental striæ, coarser at sutures, and sparse, short, broken impressed transverse lines, somewhat malleate, dirty white or yellowish, with five (sometimes four) bands, showing through the shell; whorls 5, the last inflated and greatly descending at aperture; aperture oblique, wide, with a thin broadly reflected peristome, slightly labiate within; fauces white.

Diam. 36 mill.

Boghar and Boukhrari, Algiers.

Very near to *H. constantinæ.*

H. PARETIANA Issel. Pl. 45, fig. 41.

Shell large, imperforate, subglobose, ventricose, irregularly striate, with lightly impressed spiral lines, white, with reddish bands; whorls 5, convex, the last inflated, deflexed anteriorly; sutures impressed, aperture very widely lunar, peristome narrowly reflected, appressed and dilated at base; throat reddish.

Diam. 41, alt. 32 mill. *Monaco.* (fossil.)

H. monœcensis Ramber is a synonym. Perhaps this species belongs in *Tachea.*

H. LACTEA Müller. Pl. 39, figs. 89–96.

Imperforate, depressed-globose, solid, obliquely striate, with fine revolving lines, dirty white, variously fasciate with rufous, rarely unicolored by absence or coalescence of bands; spire slightly elevated, apex obtuse; whorls 4½–5, slightly convex, rather rapidly increasing, the last wide, rounded, profoundly deflected anteriorly; aperture very oblique, truncate-oval, deep brown or black and shining within, peristome expanded, obtuse, dark colored, margins subparallel, connected by a black callus which covers the umbilical tract; columella with a heavy callus within, subdentate.

Diam. 25–40 mill.

Spain, Canary Is. North Africa; Introduced into Cuba, Buenos Ayres, and other Spanish colonies.

H. irrorata Say, *H. fauci-nigra* Chem, *H. punctatissima* Jeniss, *H. flattersiana* Ancey, *H. tagina* Servain and perhaps *H. hispanica* Mich. are synonymous. *H. axia* Bourg. is a small unfigured form, and with *H. Jacquementana* Bourg. from the *Canary Is.*, likewise unfigured, may be placed here.

Var. BATHYLÆMA Bourg.

Whorls smaller, the last inflated; mouth short and rounded; outer lip more strongly reflected than in the following varieties.

Balearic Is.

Var. ALYBENSIS Kobelt. Pl. 39, fig. 97.

A small solid form, with fine sculpture and distinct bands; whorls five; aperture intensely black. Diam. 30 mill.

Gibraltar.

Var. TAGINA Servain.

Similar to *H. alybensis* but usually flatter, with more swollen outer whorl. *Spain.*

H. GIBBOSO-BASALIS Wollaston. *Unfigured.*

Similar to *H. lactea*, but smaller, nearly concolored, dark brown, without white points or flecks; spire obtuse; whorls 4½, not much deflexed at aperture; basal margin of peristome with a distinct tooth. Diam. 24 mill.

Northern part of Ins. Teneriffe, Canaries.

H. ATAVORUM Mabille. Pl. 40, fig. 11.

Imperforate, subglobose, solid, thick, destitute of cuticle, roughly obliquely malleate, and costulately striate, grayish brown, obscurely five-fasciate; spire conoidal, prominent; apex minute, obtuse, slightly striate, shining; whorls 6, slightly convex, very rapidly increasing, the last large, globose, subangulate in front of the aperture, becoming rotund-turgid, and somewhat descending at termination of whorl; aperture oblique, rotund lunate, peristome thick, narrowly reflected, appressed at base, regularly curved, terminations distant, connected by a thin callus; base thickened inside with a subtriangular dentiform callus. Diam. 31 mill. *Grand Canary Id.* (fossil.)

H. AHMARINA (Bourg.) Mabille. Pl. 40, fig. 13.

Imperforate, depressed globose, solid, thick, shining, not transparent, with undulating interrupted spiral lines and incremental striæ; color greyish, strewn with white dots and flecks, and encircled with four dark bands; spire conic, slightly elevated, acute at the corneous or pinkish apex; whorls over 5, the last large, rounded, abruptly descending anteriorly; aperture oblique, oval-elongate, maroon colored inside. Diam. 29–34 mill.

Ins. Grand Canary.

H. PUNCTATA Müller. Pl. 39, figs. 99–100.

Imperforate, depressed globose, solid, with minute revolving lines and incremental striæ, color dirty white, four or five banded with brown or rufous, bands generally indistinct, clouded, or coalescent, rarely wanting, strewn with white points and flecks; spire depressed conic; whorls 5, slightly convex, more or less rapidly increasing, the last large, inflated, decidedly deflexed anteriorly; aperture oblique, widely semioval, blackish or brown within; peristome broadly expanded, reflexed, appressed and thickened within at base, black, the extremities approaching, connected by a dark callus.

Diam. 30–45 mill.

Spain; Northern Africa; Canary and Balearic Is; introduced into Cuba and other Spanish colonies.

The synonymy includes *H. lactea* Fér. and some other authors, *H. canariensis* Villa, *H. punctatissima* Jen., *H. bredeana*, *H. engastora*, *H. stomatodea*, *H. bandotiana*, *H. calendyma* Bourguignat.

Differs from *H. lactea* in having a thinner, smoother shell, bands more disposed to be coalescent and clouded, and basal callus not so decidedly dentate within.

Var. APALOLENA Bourguignat. Pl. 64, figs. 4, 5.

Differs from the typical form in its more depressed outline, thinner, smoother shell; whorls more rapidly increasing in width, and consequently aperture more elongated transversely.

Mediterranean littoral region of Spain and France; Balearic Is.

H. BLEICHERI Paladilhe. Pl. 39, fig. 98.

Imperforate, depressed globose, spire depressed conic, thick, with fine, curved, irregular incremental striæ, crossed by broken revolving lines, as in the preceding forms, and with vermiform transversely elongated minute wrinkles, and quadri-fasciata, when young somewhat angulate around periphery; fauces and columella margin deep castaneous; aperture very dark within, rotund-lunar, very oblique, more regularly oval than in *H. punctata;* peristome narrowly reflexed, its ends converging, connected by a thin castaneous callus.

Morocco.

Probably a variety of *H. lactea* Müller.

H. TINGITANA Paladilhe. Pl. 64, figs. 1–3.

Imperforate, globose-conic, solid, opaque, shining, with fine wrinkles, undulating revolving lines, and regular incremental striæ; whorls 4–5, encircled by four or five yellowish-purple unbroken bands, the upper ones usually confluent; spire depressed-conoidal, upper whorls rather flattened, rapidly increasing, abruptly deflected at aperture; aperture large, truncate-oval; peristome regularly curved above, straighter below, ends slightly converging, connected by a light callus; outer lip broadly expanded, light colored; throat and thickened columellar callus deep brown. Diam. 29 mill.

Between Tanger and Meknes.

Specimens before me are decidedly larger than above indicated.

H. LUCASII Deshayes. Pl. 40, figs. 14, 15.

Imperforate, orbicularly depressed, smooth, white, with five broad dark brown bands; spire short; apex brown and white, obtuse, whorls somewhat flattened, the last convex and descending anteriorly;

aperture very broadly semilunar, oblique, nearly black within; peristome expanded, obtuse, black, the ends converging and connected by a black callus; a dentate callus on columella.

Diam. 35, alt. 18–20 mill.

Oran, Algiers.

It is *H. lactea* var. of Rossm., and *H. hispanica* Mich. It is flatter than *H. lactea*, with less oblique aperture. The bands are usually continuous and distinct.

H. GHAZOUANA Debeaux. Pl. 46, figs. 47, 48.

Covered umbilicate, depressed globose, solid, very finely striate, under the lens finely spirally striate, white, encircled by five deep chestnut zones, which are interrupted throughout by vermicular white flecks and spots, behind the aperture and between the bands covered with numerous netted anastomosing lines; spire depressed conoid, apex small, slightly prominent; suture simple, linear; whorls 5, regularly, rapidly increasing, the first a little flattened, last rather inflated, rounded, below subplane, anteriorly deeply deflexed; aperture very oblique, ovate rotund, distinctly lunate, deep blackish brown within; peristome acute, upper and outer margins expanded, deep brown, edged with fuscous, margins subconverging, joined by a thin callus, the basal margin thickened, at first straight, then sharply tuberculate, before the tubercle lightly excavated, and joining the outer lip with a slight angle. Diam. 27, alt. 16 mill.

Near Nemours, Algiers.

This form differs from *H. lucasi* in the lesser size, more solid shell, and white-punctate bands.

H. HIEROGLYPHICULA Michaud. Pl. 40, figs. 17–19.

Imperforate, depressed, solid, shining, white, with brown flecks and four or five deep brown bands, the upper often interrupted; revolving lines and incremental striæ very minute; spire dome-shaped, depressed; whorls 5, *flattened;* apex smooth, obtuse; body whorl swollen, turgid below on its last half, abruptly deflexed in front; aperture very oblique, small, oblong, peristome slightly expanded, white, labiate, with a broad prominently dentate callus at base; margins connected by a light callus; fauces and columella deep castaneous. Diam. 24 mill.

Oran, Algiers.

A "var." *integrivittis*, with bands not interrupted, has been described by Ancey. (Pl. 40, fig. 16.)

H. oranica Bourg. is a synonym.

H. ALABASTRITES Michaud. Pl. 40, figs. 20–22.

Imperforate, depressed globose, lightly striate, shining, white, sometimes with five pale bands; spire convex, obtuse; whorls 5, flattened, the last compressed, obsoletely angulate, profoundly deflexed anteriorly; aperture subhorizontal, truncate-ovate; peristome labiate, slightly expanded, extremities converging, connected by a light callus, columella with a thick callus. Diam. 24 mill.

Oran, Algiers.

N. soluta Mich. is a synonym.

A *forma minor* has been noted by Ancey, diam. 20 mill. Easily recognized by the great obliquity of mouth, solid texture and subangulate whorls.

H. ATLASICA Mousson. Pl. 37, figs. 69–71.

Imperforate, globose-depressed, lightly striate and decussate, smooth, shining, white, greyish or brownish, with five bands, the three upper usually more or less confluent, and variegated with patches of white; spire slightly convex, summit not prominent; sutures linear; whorls 4–5, the last large; aperture oblique, transversely ovate; peristome acute, expanded, labiate with white; ends not converging, connected by a light callus; columella thickened within. Diam. 22 mill.

Atlas Range of Western Morocco.

H. ALCYONE Kobelt. Pl. 40, figs. 23–25.

Imperforate, depressed-conic, somewhat thick, smoothish, shining, finely striate, whitish, with four conspicuous corneous-brown bands, broken into cloudy maculations, with intermediate corneous patches; whorls 5, regularly coiled, the last widened at aperture, slightly tumid below; aperture very oblique, transversely ovate; peristome and columella white, fauces reddish; columella straight.

Diam. 28; alt. 16 mill. *Southern Morocco.*

H. JUILLETI Terver. Pl. 41, figs. 26, 27.

Imperforate, subglobose-conoidal, rather solid, shining, lightly irregularly striate, and with very minute spiral lines, slightly malleate, white, with irregular corneous maculations, especially above; banded with four or five reddish brown zones; whorls 6, regularly increasing, upper ones somewhat flattened, the last a little dilated, profoundly deflexed anteriorly; base convex; aperture very oblique,

lunate-oval, brown inside; peristome white, margins connected by a light callus; columella wide, gibbous, callous. Diam. 32 mill.

Mascara and Saida, Algiers.

Synonyms are *H. chottica* Ancey, and *H. saidana* Debeaux.

H. BAILLONI Debeaux. Pl. 46, figs. 51–53.

Covered perforate, orbicularly depressed, solid, shining, striulate, here and there lightly malleate, and under the lens seen to be encircled with fine lines, white, with four rufous bands, the second and third wide; spire slightly convex, apex large, obtuse, suture distinct, linear; whorls 4½, regularly increasing, convex, the last slightly dilated transversely, rather flattened below, excavated at umbilicus, deeply deflexed anteriorly; aperture small, ovate, oblique, lunate, with white translucent band inside; peristome simple, slightly thickened, the ends converging, joined by a thin subdilated callus, basal margin concave, dilated at its insertion, lightly callous and subdentate. Diam. 24, alt. 13 mill.

Province of Oran, between Tiut and Mograr, near the boundary of Morocco.

The large apex and small number of whorls at once separate this form from *H. juilleti*, and other allied species.

H. DENANSI Kobelt. Pl. 46, figs. 61, 62.

Covered umbilicate, depressed conoid, convex below, rather thin and solid, somewhat shining, irregularly striatulate, the striæ especially distinct below the sutures; under a strong lens showing fine spiral lines; ground-color white, bands five, brown, and under the sutures a series of radiating maculations; spire conoid, apex obtuse; whorls 5½, slowly and regularly increasing, the last decidedly widened toward the aperture, suddenly, rather deeply deflected anteriorly, but not so deeply as in other species of the group; aperture diagonal, ovate-rotund, brown within; peristome acute, outer margin expanded, ends scarcely converging, joined by a thin callus; basal margin at first straight, then truncate-tuberculate, uniting with the outer lip with a slight angle. Diam. 23, alt. 14½ mill.

"This small form of the *Juilleti* group was communicated to me some time ago by Mr. Albert Denans of Marseilles, without information regarding the exact locality from whence it came. I cannot identify it with any of the Péchaud–Bourguignat species." (*Kobelt.*)

H. BEGUIRANA Debeaux. Pl. 41, figs. 28, 29.

Umbilicate, depressed globose, transversely ovate, solid, shining, striate, at sutures costulate, with spiral impressed lines, malleate,

white, with five bands, often confluent or irregularly broken; whorls 5½–6, slightly convex, regularly increasing, the last dilated, inflated on base, anteriorly deflexed; aperture ovate-lunar, oblique, bright chestnut within; peristome white, slightly labiate, margins distant, subparallel; columella contracted, with a callous thickening.

Diam. 31 mill. *Beguira, near Mascara, Algiers.*

Probably a form of *H. juilleti* as Kobelt at first considered it.

H. WAGNERI Rossmaessler. Pl. 41, figs. 30, 31.

Similar to *H. juilleti*, but distinguished by the much more depressed form and thinner shell. From *H. begiurana* it is separated by the larger mouth, which is not contracted as in that species.

Boghar and Mascara, Algiers.

H. CHARIEIA Péchaud. Pl. 46, figs. 45, 46.

Imperforate, depressed conoid, below convex, rather solid and shining, irregularly striulate, encircled with impressed interrupted lines, and marked with longer or shorter cicatrices ["*narbenlinien*"] which cross the sculpture obliquely, especially near the aperture; color milky-white, with a narrow castaneous band at the periphery; above this band covered with narrow interrupted little bands and numerous white points, giving the color effect of coffee with milk; spire flattened conic, with blunt apex; suture linear, becoming impressed toward the aperture; whorls 6, the last slightly dilated, base convex, lightly impressed at place of umbilicus, abruptly arcuately deflexed anteriorly; aperture very oblique, semi-ovate, lunate, castaneous within; peristome obtuse, thickened, white, margins sub-converging, joined by a light callus, upper margin straight, outer slightly reflexed, basal straightened, with a more or less distinct denticle. Diam. 30–31, alt. 15–17 mill.

Mts. of Daya, at the source of the Sig, Oran, Algiers.

Allied to *H. wagneri*, but differing both in shell and dentition. According to Kobelt from whom I have taken the above description, the central teeth are somewhat asymmetrical in this species—a very unusual character in the present group.

H. JOURDANIANA Bourguignat. Pl. 41, figs. 32, 33.

Imperforate, globose, solid, shining, lightly striate, obscurely malleate, white, with four corneous brown bands, broken by irregular whitish patches; spire convex, conoidal; sutures moderately impressed; apex smooth; whorls 5½, the first flattened, regularly increasing, the last well rounded, abruptly descending anteriorly;

aperture subhorizontal, oblong-ovate, deep brown inside; peristome expanded, obtuse, its edge white, and its margins slightly converging, connected by a brown callus; basal margin thickened, subdentate.

Diam. 32 mill.

Mazagran and Mostaghanem, Algiers.

H. ARICHENSIS Debeaux. Pl. 41, figs. 34, 35.

Depressed globose, slightly dilated transversely, solid, irregularly rugosely striate, and marked with short impressed transverse lines; chalky white, obscurely four banded; whorls 6, slightly convex, gently increasing; sutures distinct; last whorl subinflated, strongly deflexed anteriorly, subexcavated around the umbilical area; aperture very oblique nearly horizontal, chestnut colored within, margins converging; peristome expanded, subreflexed, adnate at base; columella with a heavy callus.

El Arich, District of Muluja, Algiers.

Var. CRASSIDENS Debeaux. Pl. 41, fig. 36.

More globose than the type, with the columellar plication strongly developed.

H. LOBETHANA Debeaux. Pl. 46, figs. 49, 50.

Covered umbilicate, depressed trochoidal, solid, rudely irregularly striatulate, more or less malleate toward the aperture, white with four pale brown sharply defined bands, apex smooth, obtuse; suture impressed; whorls 5½, regularly and rapidly increasing, the last rounded, convex below, dilated, deeply deflected anteriorly; aperture very oblique, wide ovate; peristome acute, somewhat thickened inside; margins not approaching, and connected by a thin brownish callus; columella margin with a sharp truncate pliciform callus.

Diam. 33, alt. 21 mill.

Separated from *H. arichensis* by the convex not excavated umbilical tract, but probably not specifically distinct.

H. ZAFFARINA Terver. Pl. 41, fig. 37.

Imperforate, conoid, depressed-globose, solid, chalky white, deep brown within the aperture, irregularly striate and malleate, with impressed short transverse marks, most developed behind the broadly expanded lip; whorls 5, nucleus large, smooth, upper ones flattened, the last widened at the aperture and abruptly deflexed; aperture

very oblique, transversely truncate-oval, peristome white, sublabiate, the ends converging and connected by a light callus, the columella with a heavy dentiform callus. Diam. 30 mill.

Zaffarine Is., and adjacent mainland.

Var. ZELLERI Kobelt. Pl. 41, fig. 38.

Smaller, more globose, with four interrupted brown bands, maculated in the interspaces; aperture smaller and less intensely colored than in the typical *H. zaffarina*. Diam. 27 mill.

Mascara, Algiers.

H. doubletti Bourg. is a synonym.

H. ANOTERODON Péchaud. Pl. 46, figs. 43, 44.

Covered umbilicate, conoid-globose, solid, chalky, white, irregularly rudely striate, with subtle spiral impressed lines, body-whorl distinctly malleate; spire conoid-convex, apex small, white, suture above linear, becoming impressed; whorls 6, convex, regularly increasing, the last tumid, slightly dilated, suddenly deeply deflexed at aperture; aperture very oblique, lunate, semiovate, deep brown within, upper and lower margins parallel, scarcely converging at extremities, the upper at first rather straight, then becoming patulous, outer margin dilated, reflexed, white, with a white dentiform incurved strong lamella, basal margin castaneous on its upper part, declivous, with an abruptly truncated strong, somewhat transversely placed tooth on its anterior edge; parietal wall and throat deep brown.

Diam. 30½, alt. 22 mill.

Environs of Lella Marnia, on the Morocco boundary.

I follow Kobelt's identification of this form. It has the appearance of *H. tigri* and other forms of that group; but Kobelt says: "Es ist eine *Helix zaffarina* mit einem Gaumenzahn. Zur Gruppe der saharischen Zweizähner möchte ich sie nicht rechnen."

H. DUPOTETIANA Terver. Pl. 41, fig. 39.

Imperforate, subglobose, white, irregularly striate and malleate, with four or five brown bands, often coalescent or wanting; whorls 5, the upper ones planulate, last two convex, the last strongly deflected at the very oblique, broadly lunate aperture; peristome brownish, reflexed, sublabiate, columellar margin brown, thickened, with a decided tooth; fauces deep brown. Diam. 30–35 mill.

Oran, Algiers.

Perhaps not specifically distinct from *H. zaffarina* Terver.

H. BREVIERI Péchaud. Pl. 41, figs. 40, 41.

Large, thick, depressed conoid-globose, rough sculptured, with coarse lines of increment, and on the upper whorls and near the sutures with fine spiral striæ; last whorl malleate, vermiculate with white anastomosing wrinkles; with four broad and faint bands on a yellowish-white ground; or unicolored chalky white; whorls over 6, slightly convex, regularly increasing, the last inflated, dilated and abruptly descending at the oblique, ovate-truncate aperture; peristome white, expanded, declivous at base, with a more or less developed truncate dentiform callus; aperture larger than that of *H. dupotetiana*, castaneous within. Diam. 40 mill.

Nemour, Algiers.

Kobelt's *H. dupotetiana* var. *rugosa*, and *H. dupotetiana* var. *aspera* Gassies are synonyms. *H. subbrevieri* Bourg. may also be placed here.

H. XANTHODON Anton. Pl. 41, figs. 42, 43.

Imperforate, subglobose-depressed, white, solid, spire convex; whorls 5, slowly increasing; aperture rounded, very oblique, dark brown inside, small; peristome reflexed, white; columella margin with a heavy dentate callus. Diam. 22 mill.

Oran, Algiers.

Aperture smaller and whorls less rapidly increasing than in *H. dupotetiana*, to which it is very closely allied. A variety figured by Kobelt is larger, last whorl more inflated and malleate. The species is also nearly allied to *H. arabica*.

H. ARABICA Terver. Pl. 42, figs. 47, 48.

Imperforate, depressed globose, solid, shining, with three or four brown bands, interrupted with white, sometimes unicolored, white; spire convex; apex smooth, obtuse; whorls 5, rapidly increasing, the last rounded, inflated below, descending at the very oblique, oblong-lunate aperture; peristome white, thickened, expanded, columellar margin callously thickened, dentate and brown like the interior of the aperture. Diam. 28 mill.

Province of Oran and Adjacent Islands.

This is not the *H. arabica* of Roth, which=*H. desertorum* Forsk. *H. abrolena* Bourg., proposed because the name *arabica* was supposed to be preoccupied, is said by Ancey to be more globose, with more convex and more rapidly increasing whorls, and thicker shell than typical *arabica*. It is figured on Pl. 42, figs. 44–46.

H. ODOPACHA Bourguignat. Pl. 42, figs. 49–52.

Imperforate, depressed globose, ventricose, shining, slightly sub pellucid, white, striate and malleate; apex smooth, obtuse; spir convex; whorls 5, regularly increasing, the last rounded, abruptl deflexed anteriorly; aperture oblique, narrow, subtriangular-oblon pale brown inside; peristome white, thickened, patulous; columella margin thickened, bearing a heavy brownish callus, terminating i a thick tubercle; margins connected by a light callus.

Diam. 24 mill. *Oran, Algier*

A variety is figured by Kobelt with four narrow brown band The species is very closely allied to *H. arabica.*

H. BONDUELLIANA Bourguignat. Pl. 37, figs. 67, 68.

Imperforate, ventricose, solid, bright, chalky, lightly striate an obscurely malleate, bluish-white, obscurely unifasciate; spire conve apex small, obtuse, smooth; whorls 5½, regularly and rapidly i creasing, the last descending anteriorly; aperture oblique, luna ovate, white within; peristome sublabiate, expanded; columel margin with a white callus. Diam. 28 mill.

Oran, Algier

H. asteia Bourg. is more deflected at aperture and has dark mouth, with the columella callus slightly more developed. Said be from Madrid, Spain, but referred to *H. bonduelliana*, by Hidalg who considers it an African species. (Pl. 42, fig. 53.)

H. SENILIS Morelet. Pl. 42, figs. 54, 55.

Imperforate, globose depressed, dilated transversely, thick; whor 5½, planulate, the last dilated and deflexed anteriorly, four bande aperture truncate-oval, subhorizontal; peristome very thick, reflexe margins connected by a callus; columella dentate. Diam. 25 mi

Between Constantine and Setif, Algier

H. EMBIA Bourguignat. Pl. 42, figs. 56–57.

Covered perforate, depressed subglobose, solid, chalky whit striatulate and malleate, spire convex, apex smooth, obtuse; whor 5 to 6, the upper ones flattened, the last two convex; suture mo erately impressed; last whorl rounded, tumid below, at the apertu suddenly descending; aperture oblique, irregularly lunate, dee chestnut within, with a tooth on the base, and opposite it a sligh prominence inside the outer lip; peristome broadly expanded, la iate, margins connected by a white callus, Diam. 23, alt. 15 mill

Island of Habibas, off Algier

In addition to Bourguignat's figures of this form, I give those of Kobelt, (Pl. 61 figs.13–15.) According to the latter author, the species is not found upon the island of Rachgoun, but at *Nemours*. There is also some difference between the two authors as to the conchological characters of the species, Kobelt's form being less striate above, and measuring 26 mill. in diam., 17 in alt.

H. PSEUDOEMBIA Debeaux. Pl. 42, figs. 58, 59.

Subglobose, imperforate, solid, chalky, white, with irregular incremental striæ and short transverse impressed lines; whorls 5, slightly convex; suture moderately impressed; last whorl inflated, depressed around the umbilical area, strongly deflexed in front; aperture oblique, lunate, bright chestnut colored inside and on columella; peristome acute, the margins converging, joined by a light callus; peristome widely reflexed, albolabiate, obsoletely dentately thickened inside the outer lip; columella subexcavated, with a distinct white, truncate, dentiform fold.

Diam. 32, alt. 21 mill.

Lella Marnia, Morocco, between Nemours and Tlemcen.

Allied, according to Kobelt, to *H. zaffarina*. Its relation to *H. embia* seems quite as close, and with that species it forms the transition to "*die Gruppe der Doppel-Zähner*," as Kobelt calls the following species. Most of these are probably merely local races; for like many of the northern African shells the characters upon which the species are founded, such as texture, development of mouth parts, etc., are endlessly variable; every locality, with its slightly differing soil and climate producing a new and correspondingly differing race of mollusk.

H. BURINI Bourguignat. Pl. 42, figs. 60–62.

Imperforate, convexo-globose, shining, elegantly striate, white, with four brown bands; spire conoid, apex obtuse; whorls 5–6, slightly convex, regularly and slowly increasing, the last rounded, anteriorly descending; aperture very oblique, lunate-oblong, white within; peristome expanded, labiate, with a long basal tooth and a lamelliform denticle within the outer lip. Diam. 27 mill.

Southern Oran, Algiers.

Teeth not much more developed than in *H. pseudoembia*.

H. TIGRI Gervais. Pl. 42, figs. 63–65.

Imperforate, orbicularly depressed, solid, shining; convex below; whorls 5, slightly convex, the last profoundly deflexed anteriorly,

rounded, and banded with brown; sutures linear, slightly impressed; aperture very oblique, transversely ovate, dark brown within; peristome reflexed, white, bearing a strong basal tooth; outer lip with a strong denticle. Diam. 25 mill.

Southern Oran, Algiers.

The tubercles are strong, and situated so near to each other as to leave but a narrow space between them.

The synonyms are *H. tigriana* Bourg. and *H. maresi* Crosse. *H. stereodonta* Bourg. (Pl. 43, figs. 68, 69) *H. dicallistodon* Bourg. (Pl. 42, figs. 66, 67,) and *H. surrodonta* Bourg. (Pl. 43, figs. 70, 71,) seem to be too closely allied to the *H. tigri* to warrant separation as distinct species.

H. DASTAGUI Bourguignat. Pl. 43, fig. 72.

Imperforate, depressed, solid, striate, white, with four brown zones; spire slightly convex; whorls 5 to 6, rather rapidly increasing, the last descending anteriorly; aperture oblique, oblong-lunate, white within, with a lamelliform denticle within the outer lip and a heavy tubercle at the base; peristome expanded, slightly labiate. Diam. 27 mill. *Southern Oran, Algiers.*

Specimens occur in which the umbilicus is not wholly covered.

H. SUBJOBAEANA Kobelt. Pl. 46, figs. 54–56.

Shell depressed-globose, covered umbilicate, irregularly rudely striate, solid, unicolored grayish white; spire slightly elevated, short conoid, apex smooth, white; whorls 5, subconvex, with distinctly impressed sutures, slowly increasing, the last a little widened, not angulate, rather flat below, anteriorly subcontracted and suddenly, deeply deflected; aperture very oblique, small, semiovate, compressed, and still more contracted by two strong teeth, margins of peristome joined and apparently continuous by a thick parietal callus, outer margin with two teeth, the outer lamelliform, the inner tubercular; inside of aperture in fresh specimens brownish.

Diam. 23½, alt. 13½ mill.

Chott el Tigri, on the boundary of Morocco.

A curious form, closely allied to the following.

H. JOBAEANA Crosse. Pl. 46, figs. 57–59.

Imperforate, subglobose, obtusely angulate, smooth, slightly striate, shining, solid; sutures linear, becoming impressed; whorls 5, the last obtusely angulate, base convex, deeply, suddenly, deflexed anteriorly; aperture small, very oblique, ovate, contracted, peristome

continued over the parietal wall by a strong callus, much thickened in adult specimens, outer margin provided with two teeth.

Constantine, Algiers (fossil.)

The most bizarre of the "Gruppe der Doppelzähner."

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H. CODRINGTONI Gray. Pl. 38, figs. 72–75.

Imperforate, subdepressed, solid, coarsely and irregularly striate, decussated with fine spiral lines, white, irregularly marbled and streaked with brown, the markings usually arranged into four or five broken bands; spire depressed conoidal, apex smooth; whorls 5, somewhat convex, the last descending anteriorly; aperture large, very oblique,truncate-oval, peristome slightly expanded bearing a truncate dentiform callus at base; parietal wall with a light callus. Diam. 45 mill.

Greece and Adjacent Islands.

H. ferussaci Christ. et Jan, and *H. spiriplana* Desh. are synonyms. Bourguignat has described as species *H. eucineta, H. euchromia,* and *H. eupœcilia;* they are not even entitled to varietal rank. *H. pseudoparnassia* Mousson is also a synonym.

Var. PARNASSIA Roth. Pl. 38. figs. 74, 75.

Globose conic, with obtuse apex; last whorl not widened toward aperture, strongly and abruptly deflected anteriorly; aperture round-oval, slightly thickened at base, distinctly toothed; extremities of peristome approaching; no parietal callus. Diam. 30 mill.

Parnassus.

Var. OETÆ Kobelt.

A form with the depressed and widened body-whorl of typical *H. codringtoni,* but not larger than var. *parnassia.* Diam. 36 mill.

Mt. Ito (the ancient Oeta.)

Scarcely distinct from the type.

Var. AETOLICA Boettger.

Smaller than the type generally openly rimate; quadrifasciate, the upper band usually obsolete; spire short, exactly conical; whorls greatly depressed. Diam. 33–34, alt. 18–20 mill.

Veluchi Mts., Aetolia.

A white unicolored form is also figured (fig. 73.) The species is like all *Maculariæ,* variable in color pattern and size; and in the Grecian peninsula occupies the place of *H. alonensis* in the Iberian.

Like that species, too, the *codringtoni* seems to be an esteemed delicacy of the cuisine; for Roth relates that in the markets of Athens quantities of them are exposed for sale during the Lenten season.

H. CRASSA Pfeiffer. Pl. 38, fig. 76–77.

Subcovered umbilicate, depressed, thick, ponderous, rugosely striate, with revolving lines, and five or fewer interrupted brown bands, sometimes wanting; spire slightly elevated, apex obtuse; whorls 4–5, slightly convex, regularly increasing, the last depressed, subplanulate below, deflected in front, compressed around the umbilicus; aperture very oblique, ovate-truncate, peristome widely expanded, labiate with white, its margins subparallel, extremities connected by a light callus. Diam. 42 mill. *Corfu.*

H. INTUSPLICATA Pfeiffer. Pl. 43, figs. 73–75.

Umbilicate, depressed, solid, rudely obliquely striate, and with fine revolving lines, bluish-white; spire slightly convex, apex obtuse; whorls 5, the last flattened, anteriorly deflected, more convex below; aperture very oblique, irregularly oval, reddish within; peristome briefly expanded, margins converging; base with an internal transverse callous plication. Diam. 31 mill.

Mt. Chelmos, in Arcadia.

A rare species.

H. MASSYLÆA Morelet. Pl. 38, figs. 86–88.

Imperforate, globose depressed, somewhat solid, with irregular incremental striæ decussated by revolving lines; color yellowish white, concolored, or encircled by five reddish brown bands; spire conoid, apex smooth, obtuse; whorls 5, convex, the last widened and descending at aperture, inflated below; aperture oblique, somewhat subquadrate, as long as wide; peristome narrowly expanded, white; columella dilated, callous. Diam. 40 mill.

Algiers, Province of Constantine and southward.

A var. *concolor* is described by Bourguignat.

Var. ZENATIA Kobelt.

Last whorl less expanded; mouth shorter, and columellar callus less extended.

Wed Zenati, Algiers.

H. PRÆDISPOSITA Mousson. Pl. 39, figs. 4, 5.

Imperforate, depressed, transversely striate, with decussating lines, whitish, with four bands, the upper narrow, the second wide, interrupted with white; spire depressed conic, with large obtuse nucleus; whorls 4 to 5, rapidly increasing, slightly convex, the last dilated, strongly deflexed anteriorly; aperture very oblique, transversely ovate; peristome narrowly expanded, margins approaching, connected by a light callus; basal margin subhorizontal, wide, adnate. Diam. 29 mill.

Reraya Valley, Morocco (subfossil).

H. RERAYANA Mousson. Pl. 37, figs. 63–65.

Imperforate, depressed, irregularly obliquely striate and with transverse short irregular wrinkles; color dirty white, with flammules and flecks of brownish, indistinctly two to five banded; spire slightly convex, apex smooth; whorls 5, rapidly increasing, the last widened toward the aperture and abruptly descending; aperture very oblique, transversely oblong; peristome slightly expanded, acute, slightly thickened within, Diam. 37–41 mill.

Reraya Valley, Morocco.

H. MOUSSONIANA Wollaston. Pl. 43, fig. 76.

Large, imperforate, globose-depressed, subinflated, rather thin, strongly striate, not granulate nor malleate, lacking epidermis; spire rapidly increasing, apex smooth, obtuse; sutures irregularly impressed; whorls nearly 5, the last deflexed suddenly at aperture, convex and turgid below; aperture oblique, transverse, perfectly elliptical; peristome narrowly reflected, adnate below, its ends joined by a callus; columella excavated. Diam. 37 mill.

Ins. Gomera, Canaries (fossil).

It is *H. adonis* Mousson, not Angas. It is closely allied to the following species and to *H. alonensis.*

H. EFFERATA Mousson. Pl. 43, fig, 77.

Globosely depressed, subsolid, striate and with obtuse undulating rugose malleations, not granulate; whorls 4½, less convex and dilated than in *H. moussoniana*, obtusely angulate. Diam. 31 mill.

Ins. Gomera, Canaries (fossil.)

The pattern of sculpture,—obscure undulations obliquely crossing the striæ—is characteristic.

Both this and the preceding species may prove to belong to *Hemicycla.*

H. ALONENSIS Férussac. Pl. 43, fig. 78–82.

Covered perforate, depressed globose, somewhat solid, yellowish white, variegated with streaks and marblings of light brown, or five fasciate; irregularly striate, decussated with fine revolving lines; whorls 4–5, slightly convex, rapidly increasing, the last large, tumid, deflexed anteriorly; aperture large, rotund lunar, oblique; peristome narrowly reflexed, appressed at base, the ends converging, joined by a very light callus. Diam. 30 mill.

Southern Spain; Balearic Is.

An abundant and extremely variable species.

Var. CARTHAGINIENSIS Rossm. Pl. 44, fig. 86–89.

Similar in general characters and sculpture to *H. alonensis*, but smaller, more depressed, aperture more oval on account of the greater deflection of the last whorl; usually conspicuously five-fasciate; lip well expanded.

Diam. 24 mill.

Sierra da Cartagena, Spain.

Differs from *H. campesina* in being imperforate, with less developed peristome, which is reflected and adnate to the base of the shell. The genitalia offer some points of difference, according to Rossmæssler; but until we have descriptions or figures of those of the allied forms we can scarcely make use of this character.

Var. CAMPESINA Ezquerra. Pl. 43, figs. 83–85.

With the markings and sculpture of *H. alonensis* this variety exhibits a much more oblique nearly perfectly oval mouth, broadly expanded and reflexed peristome, scarcely or not at all appressed to base, its extremities converging and connected by a decided callus; umbilicus wide or sometimes nearly covered by the reflection of the lip. Diam. 40 mill.

Spain, provinces Marcia and Valentia.

Rossmæssler's var. *lorcana* is synonymous.

A mountain form.

Var. LOXANA Rossmæssler. Pl. 44, figs. 90–93.

Imperforate, depressed globose, usually five-fasciate, the upper bands interrupted; aperture very oblique, rounded lunar; peristome expanded, margins converging, dilated over the umbilical area.

Diam. 28 mill.

Granada.

A mountain form.

H. ALCARAZANA Guirao. Pl. 44, figs. 97–100.

Imperforate, depressed subglobose, obliquely striate, obsoletely decussated by spiral lines, yellowish white, with five brown bands, the upper ones broken into irregular maculations; spire shortly conic, obtuse; whorls 4–5, rapidly increasing, the last somewhat descending anteriorly; aperture oblique, rotund-lunar, peristome rose-colored, labiate, margins slightly converging, reflexed and appressed at the columella.

Diam. 20 mill.

Sierra de Segura, Province of Alcaraz, Spain.

It is perhaps *H. serpentina* of Graëlls.

H. GUIRAOANA Rossmässler. Pl. 44, figs. 94–96.

Umbilicate, depressed, solid, striate, whitish, five fasciate, the upper bands interrupted; spire slightly convex, whorls 4–5, rapidly increasing, the last subinflated, and abruptly descending anteriorly; aperture rotund lunar; peristome rose colored, slightly reflexed at the base. Diam. 23–28, alt. 10–12 mill.

Var ANGUSTATA Rossmässler.

Smaller; umbilicus narrower. *Granada.*

H. MARMORATA Férussac. Pl. 44, figs. 1–3.

Imperforate, globose depressed, white, five-fasciate, the upper bands regularly interrupted with white, the lower less so; above marbled with corneous; whorls 5, a little convex, the last wide and descending anteriorly; aperture widely rotund lunar, peristome rose-colored, narrowly reflexed, appressed at base, extremities approaching. Diam. 20 mill. *Gibraltar; Granada.*

H. exornata Parr is synonymous.

Size and color-pattern rather variable, but always marbled above with brown, white and corneous.

Var VIOLACEA Rossmässler. Pl. fig.

Small; last whorl strongly deflexed, deep colored, violet-lipped. *Granada.*

It is *H. balearica* var. *violacea* and var. *pulchella* of Rossmässler's Iconography, and *H. partschii* Bourg., according to Kobelt.

H. SPLENDIDA Drapernaud. Pl. 44, figs. 4–9.

Imperforate, globose depressed, white or corneous, with five deep brown bands, the upper ones usually interrupted or confluent; incremental striæ very faint; whorls 4–4½, slightly convex, rapidly

increasing, the last deflexed anteriorly; aperture rotund-lunar, oblique, white lipped; peristome narrowly expanded, reflexed, adnate at base and over the umbilicus. Diam. 15–20 mill.

Spain and Southern France.

Peristome and aperture sometimes rose tinted within. A lovely species, connecting the smaller *Maculariæ* with *Tachea*, and as far as shell characters go, intermediate between these groups.

Var. COSSONI Letourneux.

More depressed; spire moderately convex; whorls 4, more rapidly increasing, the last large; aperture less oblique than in the type. Diam. 19 mill. *Herault, France.*

H. BALEARICA Ziegler. Pl. 36, figs. 49, 50.

Imperforate, depressed, brownish white above variegated with deep brown, white, and corneous marblings; with five bands, all interrupted; whorls 5 rapidly increasing; aperture oblique, rotund-lunar, peristome narrowly reflected brownish, labiate, appressed at base. Diam. 30 mill. *Balearic Is.; Spain.*

The synonymy includes *H. hispanica* Partsch., (pl. 36, figs. 51–53) and *H. speciosa* Zieg.

Var. COMPANYONI Aleron. Pl. 36, figs. 47, 48.

Smaller than the type, more fragile and more delicately sculptured; peristome and columella white. Diam. 15–20 mill.

Balearic Is.; Catalonia.

It is *H. haspanica* var. *pyrenaica* Rossm.

H. MINORICENSIS Mittre. Pl. 38, figs. 78–81.

Imperforate, depressed, lightly striate, white with five brown bands, more or less interrupted with white, the intervening spaces maculated with corneous; spire slightly elevated, apex corneous, smooth, obtuse; whorls 4, rapidly increasing, the last wide, descending anteriorly; aperture oblique, rotund lunar, showing the bands within; peristome expanded, adnate at base. Diam. 13–18 mill.

Minorca, Balearic Is.

H. BEAUMIERI Mousson. Pl. 44, figs. 12–14.

Imperforate, globose depressed, thin, slightly striate, and with light spiral lines, evanescent at the base; whitish with five rufous interrupted bands, the upper two usually confluent, those on base narrow; spire obtuse, convex, not conic; whorls 4½, the last large, strongly and abruptly descending at aperture, subinflated, rotund

and tumid at base; aperture very oblique, transversely round-ovate; peristome expanded, subreflexed, thickened within, the margins considerably converging, joined by a callus. Diam. 24 mill.

Morocco.

H. RAYMONDI Moquin. Pl. 44, figs. 10, 11.

Imperforate, globose depressed, subsolid, yellowish white, with five subequal faint bands; spire slightly elevated, apex obtuse; whorls 4½, the last strongly deflected anteriorly; aperture very oblique, rotund-lunar; peristome labiate, margins converging and joined by callus, expanded, and adnate at base. Diam. 20 mill.

Province of Oran, Algiers.

Morelet's *H. desfontanea* is a synonym.

H. VERMICULOSA Morelet. Pl. 44, figs. 15–17.

Subperforate, turbinate, globose, solid, densely sculptured with undulating, anastomosing wrinkles, lustreless, dirty yellowish grey, more or less distinctly fasciate with wide irregular brown or yellowish bands, five in number; spire somewhat turreted, apex dark colored; whorls over 4, convex, the last inflated, descending, aperture circular, porcelain white within, very oblique; peristome narrowly expanded, margins approaching; columellar margin reflexed.

Diam. 25, alt. 22 mill.

Hir, Province of Sus, Morocco.

Comparable to *Pomatia mazzulii* in aspect, but probably more nearly related to the present group.

Unfigured species of Macularia.

H. omphalophora Dut. *Corsica.*
H. aecouria Let. et. Bourg. *Tunis.*
H. nitefacta, toukriana, mattarica, seignetti of Bourguignat. *Algiers.*
H. catharolena, simocheila, cantæ, chorista, tiranoi, lucentumensis, pelopica, and engastora, Bourg. *Spain.*
H. sevillensis Servain, *Seville.*

Section IV. ALLOGNATHUS Pilsbry, 1888.

The only member of the group *Pentatænia,* as far as known, in which the jaw is wholly devoid of the strong ribs characteristic of that division. The type and only species, *H. grateloupi* has been classed by some authors in *Leptaxis,* by others in *Macularia.* From both groups it differs in characters of shell and animal.

H. GRATELOUPI Graëlls, 1846. Pl. 48, figs. 94, 95.

Imperforate, depressed globular, rather thin, shining, whitish-corneous, or suffused with light brown, with five distinct narrow chestnut-brown bands, frequently interrupted, or broken into nearly separate maculations, very lightly obliquely striate; whorls 4, convex, very rapidly increasing, the last rotund, gently descending anteriorly; aperture rounded-lunar, very oblique, its margins converging, joined by a transparent parietal callus; peristome thin, acute, slightly expanded, regularly arcuate, columellar margin concave, adnate to the rather inflated base, and slightly tinged with brown. Diam. 21, alt. 16 mill.

Majorca, Balearic Is.

H. tessellata Fér. and *H. graellsiana* Pfr. are synonyms.

Section V, HEMICYCLA Swainson, 1840.

This group of large Helices is intermediate in conchological characters between *Macularia* and *Leptaxis*, and rather closely allied to both. In distribution it is restricted to the *Canary Archipelago*, no species being found outside the limits of that group; and it is the most prominent form of Helix in the mollusk fauna of those islands, occupying them to the exclusion of *Iberus*, *Leptaxis* and (almost) of *Macularia*. Several species very similar to recent forms are found fossil in central European miocene deposits, associated with *Macularia*, *Clausilia*, *Melanopsis*, etc.

There is a similarity between some species of *Hemicycla* (such as *H. malleata*) and certain West Indian forms of *Dentellaria*, (*H. obesa*, *H. dentiens*); this resemblance is more likely to be due to convergence of type, caused by similar environments than to any close relation or connection between these specialized forms; and the same may be safely said of the superficial likeness which the African *Macularia jobaeana* bears to the West Indian *Dentellaria formosa*, etc.

The species of *Hemicycla* are very numerous, and frequently separated by characters so slight as to render it very likely that the number of *species bonæ* would be considerably reduced by a critical study of the intermediate forms and the variations produced by peculiarities of station, hypsometical distribution, etc. Such a study however, we are not likely to have as long as the great majority of land-shell specialists pursue the intensely analytical methods now in vogue.

In the treatment of the species I have generally followed Jules Mabille, whose paper, "*Matériaux pour une fauna malacologique des iles Canaries,*" is the most recent and complete publication on the subject. A number of descriptions have been taken from Mousson, and from Wollaston.

H. PLICARIA Lamarck, 1816. Pl. 49, figs. 51, 52.

Imperforate, depressed, solid, opaque, corneous brown, lighter below, unicolored, or with very obscure darker bands above, about three in number, and sometimes a fourth just below the periphery; obliquely costate with elevated separated coarse ribs; frequently split or slightly interrupted upon the periphery, and which are crenulated by very numerous dense fine spiral impressed lines, which scarcely or not at all cut the surface between the ribs; whorls 4, moderately convex, regularly increasing, the apex nearly smooth, large, obtuse, first two whorls much smoother than balance of shell, body-whorl obtusely subangular at its beginning, becoming rounded and rather tumid and gibbous below as it approaches its termination, abruptly, deeply deflexed and deeply constricted behind the aperture; aperture *very* oblique, contracted, small, irregularly oval; peristome white, very broadly, flatly expanded, its terminations somewhat converging, joined by a thin callus; basal margin thickened within by a slightly tortuous lamellar denticle, appressed over the umbilical region, which is but slightly or not at all indented.

Diam. 22, alt. 14 mill.

Ins. Teneriffe, Canaries.

H. plicatula Lam., *H. orbiculata* Wood, *H. planorbula* Gray are synonymous. Some authors have included several allied forms under the name *plicaria*, but attention to the above diagnosis will enable any one to separate them. The sculpture of the ribs is very characteristic.

H. BENTHENCOURTIANA Shuttleworth, 1853. Pl. 50, figs. 60, 61.

In form and appearance similar to *H. plicaria*, but distinguished by the thin shell, narrow (often subobsolete) bands, regularly spaced incremental costæ, which are less developed than in *plicaria*, and without the secondary sculpture of incised lines shown by that species; the interspaces between costæ are finely striate; the young shell is pilose.

Ins. Teneriffe, Canaries.

H. SARCOSTOMA Webb et Berthelot, 1832. Pl. 49, figs. 49, 50.

Imperforate, globosely depressed, solid, flesh-tinted or yellowish, with four dark frequently interrupted bands, sometimes obsolescent, *the whole surface, including apex, covered by an extremely minute dense granulation,* rather obscurely irregularly obliquely striate, sometimes with inconspicuous vermiform anastomosing reticulating wrinkles upon the last whorl, upon which are short white marks in the direction of the whorls; apex rather obtuse; sutures well-marked; whorls 5, the outer rapidly increasing and wide, rounded, tumid, especially below, deeply descending to the aperture; not constricted; aperture very oblique, rotund-lunate; *peristome very widely expanded and flattened,* pale fleshy-white colored, very regularly arched, its margins converging and joined by a thin callus, appressed over the umbilical tract, and very slightly thickened within, scarcely subdentate. Diam. 30, alt. 20 mill.

Ins. Lanzarote, Fuertaventura and Grand Canary.

Specimens of 25 mill. diam. or less are frequent. I see nothing more than varietal characters in the following form, but admit it provisionally at this time.

H. THAUMALEA Mabille, 1882. Pl. 47, figs. 87, 88.

Shell subglobose, solid, somewhat opaque, striate, all over very finely granulate and superficially obscurely crispato-malleate, smoother below, ruddy with scattered white spots and four or five brown or blackish bands more or less intense and interrupted; spire convexo-depressed, apex reddish, obtuse, shining, rugose-punctate; whorls 5, the last most rapidly increasing, separated by impressed sutures; body-whorl very large, rounded-tumid, inflated below, slightly descending and deflexed at aperture; aperture very oblique, lunate, suboblong-ovate, the ends subapproximating, joined by a callus; peristome thick, dilated, reflexed, whitish, tinted with yellow, strongly thickened within, columellar margin contorted, shining, appressed, with an elongate lamellose tooth.

Diam. 31–33, alt. 14–16 mill.

Ins. Lanzarote and Fuertaventura, Canaries.

Shell thicker than *H. sarcostoma;* spire more depressed; the umbilical callus is very heavy and livid white in color.

H. PAETELIANA Shuttleworth, 1859. Pl. 50, fig. 80.

Imperforate, depressed conoid-globose, thin, striulate, and slightly granulate, shining, fulvous olivaceous, ornamented with five deep

brown bands; spire conic, rather obtuse; whorls 5, slightly convex, the last inflated, deflexed anteriorly; aperture large, oblique, rounded lunate, submargaritaceous within; peristome thin, labiate with flesh-color, margins converging, the right briefly reflexed, the columellar dilated, adnate. Diam. 24, alt. 15 mill.

Ins. Fuertaventura, Canaries.

A very rare species, which Wollaston believes to be the same as a large variety of *H. pouchet.* It is probably, however, distinct. My description is a translation of Pfeiffer's.

H. CHERSA Mabille, 1882. Pl. 49, figs. 32, 33.

Imperforate, depressed orbicular, solid, opaque, scarcely shining, grayish rufescent, with equidistant laminar costulæ, the interstices rugose or minutely granulate, sometimes with a brown line around the periphery; spire depressed conic, apex large obtuse, rugulose; whorls 4–5, the upper slowly, the remainder very rapidly increasing, separated by a linear suture, becoming impressed at outer whorl; body-whorl large, carinate, compresso-inflated toward the aperture, convex below, briefly, suddenly descending; aperture lunate, elongate-ovate, margins approximating, peristome livid, broadly and flatly expanded, acute, subreflexed, thickened within, outer margin regularly curved, the columella substraightened, with a long subdenticle within, and appressed at the insertion.

Diam. 23, alt. 10 mill.

Ins. Teneriffe, Canaries.

Intermediate between *plicaria* and *benthencourtiana;* differing from the first in the more depressed shell, with smoother costæ, the intervals transversely wrinkled and presenting traces of hairs, the the thicker shell, dilated last whorl, and form of the aperture; from the second, the thick shell, depressed-angulate form, and different sculpture separate it.

H. BATHYCOMA Mabille, 1882. Pl. 48, figs. 98, 99.

Imperforate, depressed subglobose, rather thick, opaque, scarcely shining, brown, with four deeper colored bands, costulate-striate, young densely squamosely pilose, adults asperate with squamose granulations; spire convex, apex rugose, obtuse, purplish; whorls 4½–5, convexo-depressed, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, rounded, anteriorly constricted, rapidly descending; aperture oblique, lunate, wide, irregular oblong-lunate, margins subapproximating; peristome acute, deeply labiate within, purplish flesh-colored, broadly reflexed, outer margin arcuate,

joining the basal at a more or less conspicuous angle, basal margin straightened thick, adnate, appressed at its insertion, and with a lamina within. Diam. 22–23, alt. 10½–11 mill.

Environs of Telde, Ins. Grand Canary.

H. EUCALYPTA Mabille, 1883. Pl. 49, fig. 37.

Shell subglobose depressed, imperforate, scarcely shining, corneous yellowish or reddish, costulate striate, asperate with minute granules, five-fasciate, the upper bands maculate; spire conic, apex obtuse, more or less deeply purpled-tinted, rugose; whorls 5–5½, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, compressed at the suture, rounded at periphery, gradually descending at aperture, subconstricted behind the peristome; aperture oblique, lunate, ovate-elongate; peristome a little thickened, expanded, in very old specimens very greatly thickened, and broadly reflexed, margins subdistant, the outer regularly curved, joining with an angle the straight basal margin, which is callous, adnate, and bears a slightly thick lamina within, in old individuals much thickened. Diam. 22–24, alt. 12–14 mill.

Ins. Grand Canary.

H. SABINIANA Mabille, 1883. Pl. 48, figs. 3, 4.

Half-covered umbilicate, depressed orbicular-convex, striate, scarcely shining, asperate with granules deposited in series, rufous, five-fasciate, and lineolate with white at the suture, below greenish, shining, apex red, granulose, crispate, shining; whorls 5½, regularly increasing, suture distinct, body-whorl large, obscurely rounded-subangulate at its origin, becoming rounded, a little shortly descending and subconstricted behind the peristome; aperture oblique, lunate, ovate-rounded; peristome acute, slightly thickened, reflexed, margins distant, joined by a thin callus, the outer slightly excavated, the columellar concave, appressed, callously reflexed at the insertion half covering the umbilicus. Diam. 23, alt. 12 mill.

Ins. Grand Canary.

H. ZELOTA Mabille, 1883. Pl. 49, fig. 30.

Imperforate, depressed orbiculate-convex, slightly thickened, solid, opaque, destitute of cuticle or lustre, dull rufous, costulate striate, with granules, especially conspicuous on the last whorl, and deposited in series; spire depressed mamillate, apex large, rugose or nearly smooth; whorls 4½–5, regularly increasing, suture slightly impressed; body-whorl large, a little tumid and angulate at its

origin, becoming rotund compressed, below obliquely compressed, a little descending at aperture; aperture oblique, lunate, small, ovate or ovate-triangular; peristome subthickened, reflexed, acute, basal margin armed with a thin lamina. Diam. 21, alt. 11 mill.

Ins. Grand Canary.

This species, found only in a fossil state, is separated from its allies by the lesser development of the last whorl, the large, obtuse apex, smaller aperture, thin peristome, and decided compression of the base.

H. EPHEDROPHILA Mabille, 1883. Pl. 48, figs. 21, 22.

Imperforate, depressed-convex, thick, solid, opaque, scarcely shining, distinctly costulate-striate, obscurely submalleate, under the lens minutely granulate; spire convex, apex minute, punctate, obtuse, shining, reddish; whorls 5–5½, regularly, rapidly increasing, sutures linear but distinct; body-whorl large, compressed-rotund, descending briefly and suddenly at the aperture, slightly constricted, not gibbous; aperture small, oblique, lunate, oblong-subrhomboidal, margins subconverging, joined by a thin livid callus; peristome thickened, reflexed, outer margin subnodulous, excavated, curved, appearing sinuous, basal margin lengthily appressed, callous, with an internal dentiform, short, tortuous lamina, columella short, tortuous, appressed over the umbilicus. Diam. 21, alt. 11 mill.

Ins. Grand Canary.

H. THEMERA Mabille, 1883. Pl. 49, fig. 38.

Imperforate, depressed-subglobose, solid, a little shining, and ornamented, under a yellowish, transparent, very evanescent cuticle, with striæ and irregular malleations, especially upon the last whorl; color brown, five fasciate; spire small, convex, apex subacute, obscurely rugose, purplish; whorls 5–5½, rapidly increasing, separated by impressed sutures; body-whorl large, compressed-rounded, a little dilated and strongly descending anteriorly; aperture oblique, lunate, oblong-subquadrate, margins subapproximating; peristome thickened, labiate within, reflexed, outer margin sinuately arcuate, basal margin straightened, thickened, armed with a long denticle, lengthily adnate on the base, appressed at the insertion over the umbilicus.

Diam. 13, alt. 8 mill.

Barranco Angostura, Ins. Grand Canary.

H. RIPROCHI Mabille, 1882. Pl. 48, figs. 7, 8.

Imperforate, slightly convex-orbiculate, striate, decussate, especially around the suture of last whorl, finely, regularly marked

with white vermicular malleations, punctate, everywhere minutely granulate, with five interrupted violaceous bands; spire subprominent, apex obtuse, shining, punctulate-rugose, purplish; whorls 4, very rapidly increasing, separated by distinct sutures; body-whorl large, compressed rotund, subconstricted, rapidly descending; aperture oblique, lunate, long ovate, slightly narrowed, margins subparallel, not approximating, much thickened, labiate within, convolutely reflexed, rosy tinted, outer margin sinuous, basal margin straightened, lengthily adnate, planulate, with a strong lamina within, and a heavy appressed callus at the insertion.

Diam. 25–28, alt. 11–13 mill.

Ins. Grand Canary.

The cuticle is very thin, corneous, usually yellowish, sometimes very bright, and exfoliates with great facility. The shell has some resemblance to *H. consobrina*.

H. JANTHINA Mabille, 1883. Pl. 48, figs. 1, 2.

Imperforate, depressed-globose, solid, somewhat thickened, a little shining, reddish, under a very evanescent, thin, yellowish cuticle, paler beneath, ornamented with five brown bands, (the second and third ordinarily coalescent), more or less interrupted with yellow spots, costulate-striate, all over malleate and under the lens minutely granulate; spire conic, apex obtuse, rugose-punctulate, bright, purplish; whorls 5, convex, regularly, very rapidly increasing, separated by subimpressed sutures; body-whorl large, rotund-tumid, obscurely subconstricted at aperture, slightly gibbous, regularly descending; aperture oblique, lunate, wide oblong-ovate, fauces bluish-white, margins subdistant; peristome thickened, reflexed, rose-tinted, outer margin sinuately incurved, basal substraightened, with a broad appressed callus at the insertion, and a strong, elevated, dentiform lamina, columella short, obliquely tortuous.

Diam. 24–26, alt. 11–12 mill.

Ins. Grand Canary.

Allied to the preceding species.

H. GRAVIDA Mousson, 1872.

Imperforate, solid, conic-globose-depressed, striate, rudely malleate, destitute of cuticle and color; spire widely conoid, apex small, smooth; suture closely subimpressed; whorls 5, first sensibly increasing, flattened, the last somewhat descending, subinflated around the suture, rounded, declivous above, subturgid below; aperture very

oblique, transverse lunate-oval; peristome obtuse, very thick, convex-reflexed, sublabiate within, margins subremote, joined by a rather thick callus, the upper and lower subparallel, the basal thickened, with a long dentiform callus inside, widely expanded, appressed and callous at insertion. Diam. 33, alt. 24 mill. (*Mousson.*)

Ins. Fuertaventura, Canaries.

A rare sub-fossil species, said to be somewhat intermediate between the *lactea* and *sarcostoma* types.

H. BATHYCAMPA Mabille, 1883. Pl. 47, figs. 84, 85.

Imperforate, subglobose, rather thick, somewhat shining, rudely striate, and under a lens minutely granulate, yellowish rufous or purplish, with five bands often interrupted with yellowish maculations; apex obtuse, rugose, purplish; whorls 5, very rapidly increasing, separated by impressed sutures, the last large, tumid-rounded, convex below and above, slightly compressed at the suture, slightly constricted at the aperture, and strongly, suddenly deflexed anteriorly; aperture oblique, lunate, ovate-rounded, the ends approximating; peristome thickened, broadly reflected and flattened, rufous, columella margin subreflexed, with a dentiform lamella.

Diam. 29, alt. 18 mill. *Fuertaventura, Canaries.*

The shell is thinner than in *H. sarcostoma*, and the sculpture different.

H. SUBGRAVIDA Mabille, 1882. Pl. 47, fig. 86.

Imperforate, solid, thick, subglobose-depressed, entirely covered with minute points and scarcely apparent costulations; spire conic, apex minute, obtuse; whorls 5, slightly convex, irregularly increasing, suture narrowly impressed; body-whorl large, angled in front of the aperture, but becoming swollen and rounded, anteriorly briefly deflexed; aperture oblique, lunate, irregularly ovate; peristome widely reflexed, slightly thickened within, the ends subconverging, joined by a conspicuous callus; columellar margin nearly straight, provided with an elongated tooth, widely expanded over the umbilical tract. Diam. 30, alt. 17 mill.

Ins. Teneriffe, Canaries.

Compare *H. gravida* Mouss.

H. BARCKERIANA Mabille, 1883. Pl. 40, fig. 10.

Imperforate, depressed, thick, solid, scarcely shining, destitute of color and epidermis, but with three or four obscure rufous bands,

striate and coarsely crispate-malleate; spire convex, subprominent, apex minute, subrugose; whorls 5–5½, first planato-convex, rapidly and regularly increasing, last very rapidly increasing; suture impressed especially at last whorl; body whorl large, rounded, below slightly flattened, toward aperture slightly dilated, briefly descending, subconstricted at the peristome; aperture oblique, lunate, oblong; peristome obtuse, reflexed; ends not converging, connected by a slightly heavy callus, basal margin nearly straight, callous, with a long internal tooth.

Quatenary of Ins. Grand Canary, near Agaëte.

Allied to the preceding.

H. CACOPISTA Mabille, 1883. Pl. 48, figs. 5, 6.

Imperforate, depressed conic, subthickened, without epidermis, yellowish ruddy, with five white-dotted rufous bands; apex minute, obtuse, granulate, concolored; whorls 5–5½, scarcely convex, subirregularly increasing, separated by distinct sutures; the last large, slightly angular, subplanulate below, briefly deflexed at aperture; aperture lunate-oblique, ovate-elongate; peristome subthickened within, widely expanded, subfragile, acute, ends converging, connected by a thin callus; basal margin slightly incurved, with a long appressed callus; columella short, tortuous, with a strong umbilical callus, and a lamelliform, elevated, straight tooth.

Diam. 26, alt. 12 mill.

Quaternary of Ins. Grand Canary, near Agaëte.

H. CATEUCTA Mabille, 1883. Pl. 47, fig. 82.

Imperforate, depressed subglobose, thick, destitute of cuticle, shining, yellowish, with four rufous spiral bands, maculated with white; spire conic, apex minute, nearly smooth, concolored; whorls 6, first plano-convex, last very rapidly increasing, separated by distinct sutures; body-whorl large, rounded, subflattened below; aperture oblique, oblong-lunate, peristome thickened, reflexed, its ends subapproximating, joined by a thin callus; columellar margin nearly straight, widely adnate, subexcavated, with a lamellose denticle.

Diam. 35, alt. 18½ mill.

Quarternary of Ins. Grand Canary, near Agaëte.

Whorls of the spire flatter than in *H. subgravida*, the last not angular and more dilated.

H. JUSTINI Mabille, 1882. Pl. 47, fig. 79.

Imperforate, depressed-conic, solid, striate, destitute of cuticle and color, not malleate nor granulate, spire conic, moderately elevated, apex minute, obtuse, whorls 5, sub-depressed, a little rounded, the first three regularly, rapidly, the last very rapidly increasing; suture very distinct; body-whorl large, angulate, anteriorly obliquely roundly subcompressed, much constricted and abruptly descending at the aperture, convex-inflated below; aperture lunate, oblique, irregularly transverse-oval; peristome thickened, obtuse, dentate, margins joined by a thick callus, outer margin sinuous, bidentate, columellar nearly straight, oblique, widely expanded over and wholly covering the umbilicus. Diam. 21, alt. 13 mill.

Quaternary of Ins. Teneriffe, near the light-house of Anaga.

H. poirieri Mabille, is a synonym.

Intermediate between *H. pouchet* and *H. bidentalis*. The teeth of the outer lip are stronger than in *H. bidentalis* more oblique in direction, and obstructing the aperture more; basal margin is less oblique, thicker, etc. The shell is neither malleate, like *H. bidentalis* nor granulate, as in *H. pouchet*.

H. HELYGAIA Mabille, 1882. Pl. 47, fig. 68.

Imperforate, depressed-conic, solid, destitute of color or cuticle, coarsely striate, and in well preserved examples with fine microscopic decurrent lines; spire widely convex, apex obtuse; whorls 4½, a little convex, rapidly (especially the outer) increasing, separated by impressed sutures; body-whorl large, turgid, visibly angulate, compressed before the aperture, suddenly descending and constricted at the aperture; aperture oblique, lunate, small, somewhat subquadrate, peristome thickened, subdentate in the middle, margins subconverging, joined by a subthickened callus; columellar margin longly appressed, excavated, adnate and callous at its insertion, uniting with the sinuous outer lip with a decided angle.

Diam. 25–28, alt. 14 mill.

Quaternary of Ins. Teneriffe near Anaga.

Allied to *H. pouchet*, but differing in the more regularly increasing whorls, less prominent spire, thick peristome, and more developed process on the outer lip.

H. CACOPLASTA Mabille, 1882. Pl. 47, fig. 75.

Imperforate, subdepressed-globulose, thick, opaque, destitute of color and cuticle, obtusely angular at the periphery, not malleate nor

granulate, irregularly striate; spire convexo-conic, slightly prominent, apex obtuse, smooth; whorls 5½, convexly rounded, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, compressed-rotund in front of the aperture, becoming rotund-tumid, somewhat constricted behind the aperture, turgid below, briefly, rapidly descending; aperture slightly oblique, lunate, wide oblong-subrotund, margins subdistant, joined by a callus; peristome thick, scarcely reflected, labiate within, exterior margin sinuous, columellar adnate, obliquely thickened, with an appressed callus and slightly excavated at the insertion of the callus.

Diam. 30, alt. 18 mill.

Quaternary of Ins. Teneriffe, at the lighthouse of Anaga.

May be distinguished by its very depressed form and rounded whorls, the body-whorl slightly angular at its origin, and the small, regular aperture.

H. CALLIPONA Mabille, 1882. Pl. 52, fig. 68.

Imperforate, conoid-subglobose, opaque, destitute of cuticle and color, densely costulate-striate; spire conic, apex obtuse, smooth; whorls 6, convexly sloping, regularly, very rapidly increasing, separated by impressed sutures; body-whorl large, carinate, more or less compressed-rotund, below convex, at the aperture deflexed, subconstricted; aperture oblique, rather small, lunate, oblong-rotund, margins subdistant, joined by a thin callus, peristome thick, labiate, convolutely reflexed, margins well-curved, the columellar oblique, adnate, with a wide appressed callus at the insertion.

Diam. 28–30, alt. 16–17 mill.

Quaternary of Ins. Teneriffe, at the lighthouse of Anaga.

Compared with *H. cacoplasta* this species is less depressed, more globulose, whorls more rounded, less sloping, striation stronger, less regular, aperture rounder, peristome thicker.

H. PERRIERI Mabille, 1882. Pl. 47, fig. 77.

Imperforate, depressed-conic, thick, opaque, destitute of color and cuticle, subacutely carinated, appearing under a strong lens finely decussated, costulately striate; spire conic, slightly elevated, apex obtuse, punctulate; whorls 5½, convexly sloping, rapidly increasing, especially the outer ones, separated by linear sutures; body-whorl large, angulate, becoming compresso-dilated, below convex turgid, constricted at aperture, and suddenly deflected; aperture subhorizontal, lunate, oblong-ovate, margins distant, joined by a thick

callus; peristome thick, bilabiate, reflexed, columellar margin adnate, thickened, appressed at the insertion of the callus.

Diam. 30, alt. 14½ mill.

Quaternary of Ins. Teneriffe, at the lighthouse of Anaga.

Allied to *verneaui* and *cacoplasta*. The peculiar compressed form of the body-whorl is very characteristic.

H. VERNEAUI Mabille, 1882. Pl. 47, fig. 70.

Imperforate, subglobose-depressed, solid, opaque, destitute of color and cuticle, obliquely, arcuately plicato-striate; spire conic, subprominent, apex obtuse, substriate; whorls 5–6, subrounded, rapidly increasing, especially the last, separated by simple narrowly impressed sutures; body-whorl large, angulate, compressed above, turgid toward the aperture (carina evanescent) and slightly constricted, slightly inflated below, suddenly and shortly deflected; aperture somewhat oblique, wide lunate-ovate; peristome thick, subbilabiate, acutely reflexed, margins subapproximating, the outer curved, the columellar well curved, adnate, appressed at the insertion of the callus. Diam. 28–30, alt. 14–15 mill.

Quaternary of Ins. Teneriffe, near the lighthouse of Anaga.

H. IDRYTA Mabille, 1882. Pl. 47, fig. 80.

Imperforate, depressed-conic, destitute of color and cuticle, opaque, striate, and with indistinct decurrent striæ, obscurely subgranulose, spire conic, apex minute, obtuse, punctate; whorls 5, slightly depressed, regularly and rapidly increasing; suture impressed, especially at last whorl; body-whorl large, angulate, laterally compressed before the aperture, abruptly descending and constricted at the peristome, convexo-inflated below; aperture oblique, lunate, irregularly ovate; peristome double, reflexed, margins converging, the outer sinuous tuberculate, angulate, the columella thick, broadly appressed, expanded over the umbilicus. Diam. 19–25, alt. 12½–13 mill.

Quaternary of Ins. Teneriffe, near Anaga.

Distinguished from its congeners by the nearly effaced striæ and slight granulation, the development of the linguaform duplication on the outer lip, the marked angulation of the body-whorl, and the wide, excavated columellar margin, smooth and rounded inside.

H. HEDONICA Mabille, 1882. Pl. 47, fig. 83.

Imperforate, depressed-conic-subglobose, solid, destitute of cuticle and color, costulate-striate and irregularly minutely malleate, spire convexo-conic, apex obtuse, rugose-punctate; whorls 5, slightly con-

vex, irregularly, the last very rapidly, increasing, separated by impressed sutures; last whorl large, angular, laterally compressed, obliquely turgid before, below flattened turgid, suddenly deflexed and constricted at the aperture; aperture slightly oblique, lunate, oblong-subquadrate, margins subconverging, joined by a thin callus; peristome obtuse, subreflexed, thickened, the columellar margin nearly straight, excavated inside, adnate at the insertion of the callus, outer margin regularly curved.

Diam. 24–27, alt. 12–14 mill.

Quaternary of Ins. Teneriffe, near Anaga.

Differs from *H. helygaia* in the very pronounced gibbosity of the last whorl, the smallness of the aperture, thinner peristome, and less convex whorls of the spire.

H. GALDARICA Mabille, 1883. Pl. 49, fig. 26.

Imperforate, depressed-convex, rather thick and solid, costulate-striate, under a lens very finely granulate, destitute of luster and cuticle, above reddish brown, with more or less intense zones which are covered with white points; spire conic, apex obtuse, mamillate, rugose-striate, whorls 5½, rather convex, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, flatly rounded, obtusely angled at periphery, descending, subdilated, and deeply constricted at the aperture, subplanulate below; aperture oblique, widely ovate-elongate, lunate, peristome subthickened within, white, very widely expanded, subreflexed, fragile, acute, the margins subapproximating, joined by a rather thick callus, the basal margin substraightened, with a prominent thick contorted tooth within.

Diam. 33, alt. 16 mill. *Ins. Grand Canary.*

Spire more elevated and prominent, suture more marked, sculpture of last whorl more regular than in *H. agaetana*.

H. LEDRUI Mabille, 1885. Pl. 40, fig. 12.

Imperforate, depressed-globose, solid, opaque, destitute of epidermis, ornamented with four bands of reddish brown, frequently interrupted, and striate, especially at the sutures, lightly granulate and a little decussated; spire convex; apex minute, smooth, shining; whorls 5½, slightly convex, irregularly increasing, suture well impressed; last whorl very large, angular, but deprived of the angle toward the aperture, and suddenly deflected, somewhat constricted; aperture lunate, subhorizontal, irregular oblong; peristome widely reflected, upper and lower margins subparallel, not converging,

connected by a thin callus, basal margin straight, thickened within, with a long tooth, a little tuberculate. Diam. 27, alt. 15 mill.

Quaternary of Ins. Grand Canary, near Agaëte.

The more salient characters are the solidity, the serrate striation and the obscure malleation. The granulation is visible only under a lens.

H. ETHELEMA Mabille, 1882. Pl. 49, fig. 31.

Imperforate, depressed-subglobose, thick, scarcely shining, yellowish, tinged slightly with red, irregularly striate, and densely, finely, granulate, with five indistinct narrow, somewhat interrupted brown bands; spire subconvex, apex obtuse, shining, granulose; whorls 5, the outer very rapidly increasing, the first two subplanulate, separated by distinct, sometimes crenulated sutures; aperture oblique, lunate, oblong-ovate, margins subparallel, somewhat approximating, joined by a white punctulate callus; peristome thick, broadly rather flatly reflexed, columellar margin adnate, with a long tooth inside, an appressed callus at the insertion and an obtuse angle at junction with outer lip. Diam. 27, alt. 13 mill.

Ins. Grand Canary.

Allied somewhat with *H. gomerensis*; but with more elevated spire, last whorl more angular, peristome much thickened and dilated.

H. AGAETANA Mabille, 1883. Pl. 46, figs. 64, 65.

Imperforate, subdepressed-globose, rather thick, solid, opaque, greyish rufous, with three or four interrupted bands, color and cuticle frequently deciduous, densely costulate-striate, and crispate-malleate, above (under the lens) very minutely pustulose, below flattened-turgid; whorls 6, a little convex, regularly and rapidly increasing, separated by distinct sutures; body-whorl large, convexly rounded, more or less angulate at the periphery, deeply deflexed at the aperture, and strongly constricted at peristome; aperture oblique, lunate, irregularly subtriangular-ovate, peristome slightly thickened, widely, flatly expanded, somewhat reflexed, thin, subfragile, dull reddish or yellowish, margins converging, subapproximating, joined by a conspicuous lamina, the outer subsinuous, basal somewhat straight, adnate, with a prominent elongate, generally white lamelliform tooth. Diam. 28–30, alt. 14–16 mill.

Ins. Grand Canary, near Agaëte.

Allied to *H. galdarica*, but with the peristome of *H. sarcostoma*.

H. SAULCYI d'Orbigny, 1839. Pl. 49, figs. 45, 46.

Imperforate, globose-conic-depressed, rather solid, greyish, or purplish without lustre, encircled by five bands of deep brown, the supraperipheral and following bands generally confluent, the whole surface covered with a fine netting or malleation formed by anastomosing oblique wrinkles of white or light grey color, and a secondary sculpture of microscopic granulations; apex and first 1½ whorls dark brown, smooth, shining; suture linear, becoming impressed near the aperture; whorls 4½, gradually increasing, the last somewhat widened toward the aperture, with an indication of an angle at its origin, gibbous below, abruptly and rather deeply deflexed anteriorly, and subconstricted behind the peristome; aperture very oblique, oblong-lunate; peristome expanded, pinkish, arched above and below, the ends converging, joined by a scarcely visible yellowish parietal callus; basal margin appressed over the umbilical tract, obviously dentately thickened within.

Diam. 25, alt. 16 mill.

Ins. Grand Canary.

There is considerable variation in sculpture, the malleations being sometimes arranged in more or less regular oblique series.

Var. TEMPERATA Mousson, 1872. Pl. 49, figs. 47, 48.

Shell larger than *H. saulcyi*, spire less elevated, body-whorl more angular, sculpture less coarse, columellar tooth smaller, peristome more developed, thicker. Diam. 24, alt. 17 mill.

Ins. Grand Canary.

This form is closely allied to *H. saulcyi*, and is considered by Wollaston to be merely a variety of that species.

H. BAIA Mabille, 1883. Pl. 47, fig. 76.

Shell globose-depressed, imperforate or subperforate, somewhat thickened, very solid, destitute of color or cuticle, coarsely malleate, the malleations disposed in oblique series, strongly striate, the striæ interrupted; spire elevated, convex, apex minute, smooth, concolored; whorls 5½–6, convexo-depressed, subregularly, the outer very rapidly, increasing; sutures impressed; last whorl large, rounded, inflated, very suddenly and briefly descending anteriorly, subconstricted at the aperture, inflato-convex below; aperture oblique, rotund-lunate, peristome thickened reflexed, acute, margins not converging, joined by a well-marked callus, the basal margin substraightened, adnate, with a lamellose tooth within.

Diam. 28–34, alt. 18½–21½ mill.

Ins. Grand Canary; fossil.

This species presents the following differences from *H. temperata;* the shell is smaller, more globose, whorls higher, striation more marked, the sculpture is clearer, and accompanied with granules, etc., etc. It is larger than *H. saulcyi*, more regularly sculptured, whorls less rapidly increasing, and aperture rounder.

H. EMBRITHA Mabille, 1882. *Unfigured.*

Imperforate, conic-depressed, thick, subopaque, without cuticle or color, rudely crispato-malleate, spire convex, prominent, apex smooth, shining, obtuse; whorls 5–6, first convex-sloping, the last compressed rounded, regularly rapidly increasing, separated by impressed sutures; body-whorl large, angular in front of the aperture, becoming round, deflexed anteriorly, constricted at the aperture, swollen below; aperture oblique, lunate, oblong, margins sub-distant, subparallel, joined by a callus; peristome thickened within, widely reflexed, shining, subrevolute; columellar margin adnate, strongly thickened, appressed over umbilicus, nearly straight, armed with an obtuse lamina. Diam. 27, alt. 16 mill.

Quaternary of Puerto-da-Luz, Ins. Grand Canary.

Most nearly allied to *H. saulcyi*, but may be distinguished by the thicker shell, larger size, irregular malleation and the entire absence of granulations; from *H. temperata* the more depressed form and more prominent spire separate it.

H. CRYPSIDOMA Mabille, 1882. Pl. 47, fig. 71.

Imperforate, subdepressed, orbiculate, solid, thick, opaque, covered with sharp malleations; spire slightly convex, apex obtuse, shining, rugulose; whorls 5–5½, slightly convex, inner regularly, the outer very rapidly increasing, separated by impressed sutures; body-whorl large, angular at its origin, becoming turgid-rounded, subconstricted and briefly deflected at the aperture, slightly tumid below; aperture lunate, oblique ovate-oblong, margins acute, the columella adnate, appressed, provided with a dentiform lamina.

Diam. 27, alt. 16 mill.

Quaternary of Puerto-da-Luz, Grand Canary.

More depressed, thicker, with less prominent spire than *H. saulcyi*, and peristome more developed.

H. STULTA Mabille, 1883. Pl. 47, fig. 69.

Imperforate, subglobose-depressed, thick, solid, opaque, destitute of color and cuticle, coarsely reticulato-malleate; spire conic, apex obtuse, smooth; whorls 5–5½, first convex, regularly, the last rapidly

increasing; suture impressed; body-whorl large, turgid, inflated, rounded at periphery, descending and subconstricted at aperture; aperture slightly oblique, lunate, transverse oblongo-subquadrate, margins subremote, joined by a shining calcareous lamina; peristome patulous, broadly reflexed, acute, thickened within, external margin sinuous, columellar margin with an adnate callus, appressed at its insertion, with a strong elongated tooth inside.

Diam. 35, alt. 18 mill.

Fossil at Puerto-da-Luz, Grand Canary Is.

H. CARTA Mabille, 1882. Pl. 47, fig. 89.

Shell subglobose-conic-depressed, thick, opaque, striate and rudely malleate; spire conic, prominent, apex obtuse, smooth; whorls 5, convex, regularly, rapidly increasing, separated by distinct sutures, the last large, rounded, slightly dilated and turgid anteriorly, convex below; aperture oblique, lunate, oblong-ovate, margins subdistant; peristome acute, reflexed, thickened within, outer margin sinuous, columella thickened, expanded and appressed over the umbilicus, within strongly lamellose-dentate. Diam. 29–31, alt. 16–18 mill.

Ins. Grand Canary, fossil in quaternary of Puerto-da-Luz.

Compared with *H. temperata* the size of *H. carta* is larger, the last whorl less globular, the body-whorl obviously angular in front, and it lacks granulation.

H. RETRODENS Mousson, 1872. Pl. 50, figs. 68, 69.

Imperforate, globose-convex, scarcely angled, strongly striate, in part elongate malleate, shining, nearly destitute of cuticle, very pale brownish-olive, white below, with three indistinct bands, interrupted with streaks of white; spire obtuse, subconoidal, apex rather large, obtuse, granulose-rugose; sutures subimpressed; whorls 4½, slightly convex, the last rapidly, deeply deflexed anteriorly, gibbously inflated and constricted behind the aperture; aperture contracted, very oblique, white, subcircularly trigonal; peristome thickened, white, acute, broadly, flatly reflexed, the margins subconverging, joined by a thick callus, the basal with a heavy callus at the insertion, and a recurved pliciform tooth. Diam. 17, alt. 12 mill.

Ins. Teneriffe, Canaries.

Related, according to Mabille, to *H. paeteliana*, differing in its small size, angulation of last whorl, the excavation of the umbilical tract, the strong striæ, white spots, and the small aperture.

H. POUCHET Férussac, 1821. Pl. 49, figs. 53, 54; pl. 61, fig. 16; pl. 52, figs. 69–71.

Shell imperforate, depressed subglobose, not shining, rather strong and solid, unicolored brown, or with faint dark bands, the first, narrow, subsutural, second and third above the periphery, generally confluent, fourth immediately below the periphery; spire low conic, apex obtuse; sutures impressed; whorls 4½, regularly increasing, the last scarcely wider than the antepenultimate, but near the aperture somewhat dilated, then strongly constricted and deeply deflexed; first whorl not striate, very minutely granulate, nearly smooth; the following more or less coarsely obliquely irregularly striate, the striæ and intervening spaces generally marked with extremely minute spiral impressed lines, and the whole surface irregularly granular, especially below; the body-whorl at its beginning is angular and rather compressed; its last third is rounded, inflated, and gibbous below; aperture very oblique, rounded trigonal, white within; peristome reflexed, much thickened, its margins converging, the upper angularly arched, outer margin bearing an obtuse small dentiform callus, generally inconspicuous, upon its face, lower margin straightened, with a rather heavy subtruncate callus within, forming an angle at junction with outer lip. Diam. 23, alt. 14 mill.

Ins. Teneriffe, Canaries.

H. adansoni Webb et Berth. and *H. poucheti* Mabille are synonyms.

H. DESCULPTA Mousson, 1872.

Imperforate, conic or depressed-subglobose, with smooth (not incised nor granulate) costulose striæ, destitute of color or cuticle; spire convex, wide-conic, aperture obtuse, suture impressed, simple; whorls 5, slightly convex, the last not abruptly descending, a little inflated and constricted, well rounded, not angulate, somewhat inflated below; aperture very oblique, small, coarctate, transversely obtusely triangular; peristome thickened, broadly reflexed, margins not approaching, joined by a callus, the basal subelongate, flatly expanded and adnate at the insertion, joining the outer lip at an angle. Diam. 21, alt. 16 mill.

Ins. Fuertaventura, Canaries.

A subfossil form, said to be intermediate between *H. pouchet* and *H. plicaria.*

H. MODESTA Férussac, 1819. Pl. 50, figs. 62–64.

Imperforate, solid, depressed, dark olivaceous or brown above, shading into light yellow on the base, frequently with obscure ill-

defined darker bands, four or five in number; spire depressed convex-conic, apex rather obtuse, obsoletely granulate; whorls 4½, coarsely obliquely, irregularly striate, the last rudely, obviously malleate, at its origin angulate, its last third rounded, inflated, widened in the immediate vicinity of the aperture, then constricted, gibbous below, deeply deflexed anteriorly; aperture very oblique, rounded trigonal; peristome broadly reflected, pinkish gray, labiate with darker, its ends converging and joined by a scarcely perceptible callus; upper margin well arched, subangular in the middle; lower margin straight, adnate, with a thick white lamella within, and joining the outer lip at an angle. Diam. 19, alt. 12 mill.

Ins. Teneriffe, Canaries.

H. paivana Lowe is a synonym.

May be separated from *H. pouchet* and other allies by the rude malleation, and the lack of spiral impressed lines.

H. IDIOTRYPA Mabille, 1883. Pl. 48, figs. 12, 13.

Imperforate, convex, depressed subglobose, solid, opaque, scarcely shining, uniform whitish green, irregularly malleate and rugose, plicate-striate; spire convex, apex rugose, obtuse, decorticated, unicolored; whorls 5, first 3 flat, slowly increasing, the remainder a little convex, rapidly widening, separated by linear suture, impressed on last whorl; body-whorl large, subacutely angled, becoming turgidly rounded toward the aperture, obliquely subdilated, scarcely constricted, abruptly descending, flattened and shining below; aperture oblique, lunate, subquadrate-oval; peristome a little thickened, white-labiate within, acute, flatly expanded, margins subconverging, the columellar straightened, excavated, adnate.

Diam. 20, alt. 9½ mill.

Ins. Teneriffe, Canaries.

H. MALLEATA Férussac, 1821. Pl. 49, figs. 42, 44.

Imperforate, globosely-depressed, somewhat dilated transversely, strong and solid, olivaceous brown, base lighter, generally with five dark spiral bands, the second and third coalescent, the lower one narrow and faint; spire somewhat conic, obtuse; suture moderately marked; whorls 4½, regularly increasing, the first one or two reddish, apparently nearly smooth, but finely granulate under the lens, the balance irregularly obliquely striate, microscopically granulate, rather finely and very regularly malleate; body-whorl angular at its origin, but rounded and with very gibbous base on its last third,

very abruptly deflexed at aperture, and grooved behind the peristome; aperture irregularly triangular-trilobate, the peristome white, at the upper angle produced downward into a lobe or tooth, the outer lip with a similar but narrower tooth, columellar margin substraightened, thickened within, adnate to the gibbous base.

Diam. 20, alt. 14 mill.

Ins. Teneriffe, Canaries.

Lamarck published this species as *H. bidentalis* before the *description* of *malleata* was published. But since the species is universally known by the latter name it is scarcely advisable to change.

A well known and easily recognized species, quite variable in the development of the peristome and in size; extreme specimens measure: Diam. 24, alt. 16 mill., and *forma minima*, diam. 12 mill.

Var. NIVARIÆ Wollaston.

Larger than the type; body-whorl not keeled, less deflected anteriorly; aperture more triangular, peristome more thickened, more reflexed, margins less converging, the basal more straightened, the upper margin with the teeth nearly obsoiete.

Diam. 22, alt. 13 mill.

Ins. Teneriffe.

H. GLASIANA Shuttleworth, 1852. Pl. 49, figs. 40, 41.

Imperforate, depressed globose, solid, above grayish yellow, more or less streaked and suffused with the dark coffee color of the bands, which are five in number, the upper ones generally interrupted, often broken into oblique streaks, the peripheral and lower bands wider, usually continuous, base dull yellow; spire conic-convex, apex obtuse; suture well marked; whorls 4–4½, the first minutely granulate, the following densely granulate, irregularly obliquely striate, the striæ mostly broken into coarse granules, below the periphery almost smooth; body-whorl not angular, well rounded, the last third very gibbous below, widened toward the aperture, somewhat deflexed, lightly constricted; aperture oblique trigonal,, subtrilobate; peristome much thickened, narrowly reflected, bearing on the upper outer margin an obtuse tubercular tooth, base adnate, wide, with a a callous lamella within. Diam. 18–22, alt. 14–16 mill.

Ins. Grand Canary.

H. pellis-lacerti Reeve (fig. 40.) and *H. malleata* var. *b.* Pfr., are synonyms.

H. GLYCEIA Mabille, 1882. Pl. 47, fig. 78.

Imperforate, subglobose-depressed, thick, irregularly striate sometimes obscurely granulate; spire obtuse conic, apex mamillated smooth; whorls 5, depresso-convex, sensibly increasing, separated by linear sutures, the last large, angulate-rotund, abruptly, shortly deflexed and obliquely dilated at the aperture, turgid below; aperture oblique, lunate, irregularly subquadrate; peristome thick, revolute, thickened within and without, margins not approaching, joined by a thin callus, outer margin angularly curved, middle tuberculate, the columellar margin longly appressed, thick, callous at its insertion, and provided with a long lamellose tooth inside.

Diam. 26–30, alt. 15½ mill.

Quaternary of Ins. Teneriffe, near the lighthouse of Anaga.

H. EMPEDA Mabille, 1883. Pl. 47, fig. 81.

Imperforate, opaque, striate-costulate; spire conic, apex mamillate, obtuse, punctulate; whorls 5, convexly sloping, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, rotund-inflated, obscurely angular at the periphery, at aperture compresso-declivous, slightly constricted, rapidly descending, turgid below; aperture very oblique, lunate, irregularly rounded; margins distant, peristome thick, somewhat reflexed, labiate within, external margin obliquely subdentate in the middle, angularly curved, base arcuate, slightly excavated, feebly dentate; columella short, covering the umbilicus with a strong callus. Diam. 25, alt. 16 mill.

Quaternary of Ins. Grand Canary.

Allied to *H. glasiana* and *H. fritschi;* from the former its greater size, the elevation of its conical spire, and the thicker, more oblique peristome distinguish it; from the latter, the curved base (straight in *H. fritschi*), and different armature of same, separate the present species.

H. FRITSCHI Mousson, 1872. Pl. 50, fig. 91.

Imperforate, globose or subdepressed globose, densely minutely costulate-striate, the costulæ subundulating, subgranulate, base smoother; grayish green, paler beneath, with four violet-brown bands and scattered elongated small white spots; spire obtusely convex, apex flattened, corneous, rapidly increasing, minutely granulate-rugose; suture lightly impressed, subirregular; whorls 4, the last large, rounded, rapidly descending, slightly subinflated and subconstricted, below somewhat tumid; aperture oblique, rounded-

triangular, showing the bands within ; peristome a little thickened, shortly subreflexed, sublabiate within, margins not approximating, the upper arcuately descending, sometimes with a small tubercle, the basal, rather flattened, subcallous, straight within, expanded and appressed at the insertion. Diam. 17–24 mill, alt. 13–18 mill.

Ins. Gomera, Canaries.

The peristome usually bears *traces* of the teeth which are so prominent in the preceding forms. From them, the globose, thin shell at once separate it.

H. CONSOBRINA Férussac, 1819. Pl. 50, figs. 87, 88.

Imperforate, depressed, solid, yellowish brown, with five dark brown bands, the upper ones generally interrupted with light flammules ; spire depressed conic, sutures slightly impressed ; whorls 4½, upper ones scarcely convex, the first shining, light brown, microscopically granulate, as is the whole shell usually ; last whorl wide, becoming wider toward the aperture, finely reticulate-malleate, irregularly striate, smoother below, not angulate, the last third gibbous below, above descending rather abruptly to the aperture, scarcely contracted behind the peristome ; lip more or less widely reflected, its face thickened, rounded, white or pinkish, microscopically granulate, the margins converging, joined by a thin or moderate callus ; upper margin arched, outer margin with an obtuse subobsolete tooth-like callus upon its face, lower margin broad, flattened, bearing inside a dentiform callus.

Diam. 19–23, alt. 11–14 mill.

Ins. Teneriffe, Canaries.

I am not satisfied with the synonymy of the *consobrina* group ; for I believe that several of the following forms are merely varieties of that species. It is impossible however, to work the species out with the meagre material before me.

A var. *vetusta* Mouss., is more depressed, suture less impressed, last whorl subangulate, and aperture smaller than the type.

H. EVERGASTA Mabille, 1882. Pl. 48, figs. 100, 101.

Imperforate, subglobose-conic, solid, sub-shining yellowish rufous, with four conspicuous brown bands, irregularly costulate-striate and with very dense decurrent lines, visible only under a lens, giving the shell a peculiar granulose appearance ; spire conic, prominent, apex minute, obtuse, concolored, rugose ; whorls 5, slightly convex, regularly increasing, separated by subimpressed sutures, accompanied

by a very narrow white zone, and perceptibly crenulated; body-whorl large, rounded-sloping, subangulate, gently descending at the aperture and very strongly constricted; aperture very oblique, irregularly lunate-oval, peristome not reflexed, broadly, flatly expanded, white within, yellowish without, margins approximating, joined by a white callus, the columellar a little straightened, denticulate, adnate at the appressed umbilical callus.

Diam. 23½–25, alt. 14–15 mill.

Ins. Teneriffe, Canaries.

A very distinct form, remarkable for the regularly conic spire, brilliant peristome, and incised decurrent lines.

H. CACOPERA Mabille, 1883. Pl. 49, fig. 34.

Imperforate, thick, opaque, irregularly striate, dull purplish, very irregularly malleate, especially upon the last whorl, under a lens very finely granulate, the upper whorls smooth; spire depressed-conic, little elevated, apex punctulate, shining, obtuse, concolored; whorls 5, rapidly increasing, separated by impressed sutures; body-whorl large, angulose-rotund, flattened and impressed in the centre beneath, toward the aperture regularly descending, subconstricted and slightly gibbous; aperture oblique, lunate, transversely triangular; peristome flatly expanded, not reflected, the margins subdistant, columellar margin straightened, thick, white, excavated, lengthily adnate, briefly appressed at insertion, joining the broadly arcuate outer lip at an angle. Diam. 21, alt. 10 mill.

Ins. Gomera, Canaries.

Differs from *H. consobrina* in the more compact coiling of the whorls, the last one simply rounded, not inflated; the peristome is slightly thickened, flat, angular at the junction of the columellar and outer margins, not reflexed and callous as in *H. consobrina.*

H. BATHYCLERA Mabille, 1885. Pl. 49, figs. 23–25.

Imperforate, convex-depressed, solid, opaque, slightly shining, rudely striate, obscurely malleate, yellow reddish, with five subevanescent blackish bands, interrupted with yellow; spire convex, apex shining, purplish, punctulate; whorls 5, regularly, rapidly increasing, separated by impressed sutures; body-whorl large, inflated above, concave below, subdilato-compressed toward aperture, suddenly shortly deflexed and a little constricted behind the peristome; aperture lunate, oblique, irregularly triangular-ovate; peristome

thick, reflexed, margins converging, the basal appressed, obscurely subdentate, with a adnate callus.

Bufadero, Ins. Teneriffe, Canaries.

This species is more depressed than the *H. consobrina*, the last whorl is without trace of angulation, is not gibbous toward the aperture nor sensibly constricted, but is more deflected; the striation is stronger, and the surface is not granulate.

H. THANASIMA Mabille, 1883. Pl. 47, fig. 74.

Imperforate, conic-depressed-globose, striate, irregularly malleate, minutely granulate; spire convex-conic, apex smooth, obtuse; whorls 4–5, the upper rapidly, the following very rapidly increasing, separated by subimpressed sutures; body-whorl large, distinctly carinated at the periphery, toward the aperture gibbously dilated, narrowly, superficially constricted behind the peristome, obliquely dilated beneath; aperture oblique, lunate, transversely subquadrate; peristome thickened, revolute, obtuse, margins subapproximating, joined by a callus; the outer margin markedly sinuous, tuberculate in the middle, basal margin concave, excavated, adnate and impressed at insertion. Diam. 23, alt. 14 mill.

Quaternary deposit at Anaga, Teneriffe.

H. EPHORA Mabille, 1882. Pl. 47, fig. 72.

Imperforate, subglobose-turbinate, thick, solid, opaque, costulate-striate, all over minutely malleate-punctulate; spire moderately prominent, apex obtuse, smooth; whorls 5, regularly, rapidly increasing, separated by impressed suture; the last large, angulate, toward the aperture compressed-rotund, constricted; aperture oblique, lunate, subovate-triangular; peristome thick, reflexed, margins approximating, the outer sinuously subdentate, the columellar arcuate, appressed, closing the umbilicus with a moderate callus.

Diam. 19½, alt. 11 mill.

Quaternary deposit at Anaga, Teneriffe.

Intermediate between *consobrina* and *invernicata*.

H. CARDIOBOLA Mabille, 1882. Pl. 47, fig. 73.

Imperforate, depressed-subconic, destitute of cuticle and color, thick, indistinctly striate, striæ now and then punctate; spire depressed-conic, apex obtuse, minute; whorls 5, subdepressed, rapidly increasing, especially the last, separated by impressed sutures; body-whorl large, from above appearing dilated near the aperture, below inflated; aperture oblique, subovate, peristome thick, slightly

reflexed, labiate, margins subremote, the outer bidentate, columellar subexcavated, longly adnate, covering the umbilicus by a wide expansion. Diam. 22–23, alt. 12 mill.

Quaternary of Ins. Teneriffe, at the lighthouse of Anaga.

The slightly dilated last whorl, not constricted, well developed peristome and irregularly triangular small aperture separate this form from its allies.

H. GUAMARTEMES Grasset, 1857. Pl. 50, figs. 81–83.

"Imperforate, subglobose, reticulato-malleate, color very variable, yellowish or brown, sometimes with five deep brown subinterrupted bands; whorls 4½, slightly convex, the last anteriorly deflected; aperture ovate-lunar; peristome reflexed, submargined, shining, thick, flesh-tinted. Diam. 20, alt. 12 mill." (*Grasset.*)

Ins. Grand Canary.

H. manriquiana Lowe, and *H. guartemes* Martens are synonyms.

Specimens of this form before me are thinner and of lighter texture than *H. consobrina*. They are frequently unicolored; and the peristome is not (generally) so heavy; its upper margin is highly arched, subangular; and the whole shell is finely granulose, as in the allied species.

H. INVERNICATA Mousson, 1872. Pl. 50, fig. 86.

Imperforate, depressed subglobose, striatulate, irregularly malleate, obsoletely microscopically granulate, very bright, brownish yellow, with four or five brown bands, streaked and maculated with yellow; spire obtusely convex, regular; apex minute, brownish purple, smooth; sutures simple, subimpressed, whorls 4½, rather rapidly increasing, slightly convex, the last large, descending, rounded, inflated, slightly constricted, below lighter colored, and slightly impressed in the center; aperture oblique, subample, transversely irregularly oval; peristome acute, moderately reflexed, thickened within, margins subconverging, the upper subsinuately incurved, basal margin slightly curved, nearly straight, thickened, at the insertion, adnate. Diam. 21, alt. 12 mill.

Ins. Teneriffe, Canaries.

The original description is translated above. Of this species Wollaston says: "I cannot feel absolutely satisfied that it is more in reality than a smaller and ungranulated race of the *consobrina*, in which the transverse lines of growth are a trifle less evident and the malleations a little more so, and in which the surface is altogether

more glossy and shining, and the color of a more uniform ochreo-olivaceous brown speckled with small irregular angulated blotches and fragmentary reticulations of yellow. It is generally smaller than the *H. consobrina*.

H. MAUGEANA Shuttleworth, 1852. Pl. 50, fig. 94; Pl. 48, figs. 14–16.

Imperforate, depressed-globose, in young shells very thin and transparent, in adults solid, yellowish brown or brownish yellow, not shining, lightly striate and irregularly reticulate-malleate, under the lens densely finely granulate, four or five fasciate, the bands sometimes interrupted, the second and third frequently coalescent; spire conic, apex minute, purplish, shining, minutely rugose; suture distinct; whorls 4½–5, the last rapidly increasing, large, rounded tumid, toward the aperture somewhat gibbous, slightly constricted; base rather convex, slightly impressed in the centre; aperture oblique, lunate, oblong-oval, margins subparallel, subapproximating; peristome slightly thickened, reflexed, violet tinted, basal margin adnate, thickened within, whitish. Diam. 20, alt. 11 mill.

Environs of Saint Croix, Ins. Teneriffe, Canaries.

It is *H. gaudryi* of Reeve, and, in part, of Pfeiffer. There has been some doubt as to the precise form described by Shuttleworth, and the confusion is increased by the fact that he assigns no habitat nearer than "Canaries" in his description. I have accepted Mabille's identification.

The species is quite variable in the development of the bands, and the intensity of the color.

H. DISTENSA Mousson, 1872. Pl. 50, figs. 89, 90.

Imperforate, globose-depressed, rather thin, striate, obsoletely malleate, not granulose, rather shining, reddish brown or yellowish, unicolored or with five brown bands interrupted with white; spire very obtuse, convex, subirregular, apex minute smooth, flattened; suture impressed; whorls 5, slightly convex, the inner gradually, outer rapidly increasing; body-whorl well rounded, not gibbous nor constricted, base convex, subinflated, in the centre impressed; aperture oblique, transversely elongate-oval and angulose, showing the bands within; peristome acute, narrowly expanded, not reflexed, within labiate with white, broadly margined with white without, margins not converging, subparallel, the basal margin slightly

arcuate, within straightened, flattened, adnate, thin, subexcavated and impressed at the insertion. Diam. 16½, alt. 11½ mill.

Ins. Gomera, Canaries.

Of this little-known form Mabille says: A species intermediate between *H. guamartemes* and *H. perraudieri.* It is much more globular than the latter; its whorls, particularly the last are inflated; the ornamentation consists of a nearly effaced malleation, with traces of granulation visible only under a strong lens.

H. HEDYBIA Mabille, 1882. Pl. 48, figs. 9–11.

Imperforate, depressed-globose, solid, striatulate, under a lens punctulate or irregularly malleate-crispate, not shining, rosaceous; spire globose-convex, apex obtuse, smooth, unicolored; whorls 5, convex, rapidly increasing, especially the last; suture impressed; body-whorl rounded, abruptly descending, toward the aperture angularly dilated, not gibbous; aperture oblique, transversely ovate, margins subconverging; peristome acute, white, thickened within, columellar margin subconcave, planulate, adnate, joining the outer lip with an obtuse angle. Diam. 18–20, alt. 9½–10 mill.

Canaries.

Spire more elevated than in the *H. distensa,* more acute, not mamillated, last whorl more obviously angled, more descending, etc. From *H. perraudieri* the large size, globular form, solidity and different sculpture will separate it.

H. PERRAUDIEREI Grasset, 1857. Pl. 50, figs. 70–72.

"Imperforate, globose-depressed, regularly and minutely malleate, yellowish, apex blackish; whorls 5, slightly convex, the penultimate angulate, the last descending; aperture subangulate-lunar, peristome reflexed, thick, white margined within and without, columellar margin callous, subexcavated at the base. Diam. 16, alt. 9 mill." (*Grasset.*)

Ins. Hierro, Canaries.

The body-whorl is subangular at its origin. The peristome is generally yellow more or less pronounced.

H. HIERROENSIS Grasset, 1857. Pl. 50, figs. 57–59.

"Imperforate, subglobose, striate, minutely granulate, below yellowish green, above with four very faint brown bands; whorls 5, a little convex, the last anteriorly descending; aperture wide lunar; peristome reflexed; thickened, white, columellar margin callous. Diam. 21, alt. 13 mill." (*Grasset.*)

Ins. Hierro, Canaries.

H. valverdensis Lowe is a synonym.

"It is much smaller than *H. gomerensis* and rather more globose in contour; but in color and sculpture it has much in common with that species. It is however, more opaque above (the minute sand-like granules with which it is closely beset being perceptibly coarser and more defined); and its color is of a dull olivaceous coffee-brown, rather than of a reddish castaneous." (*Wollaston.*)

H. INDIFFERENS Mousson, 1872. *Unfigured.*

Imperforate, depressed globose, striate, in part obliquely undulate-rugulose, irregularly granulose, destitute of color; spire obtuse subconic, regular, apex obtuse; suture impressed; whorls 5, moderately increasing, convex, the last not dilated, well rounded, rapidly a little descending, subgibbous and subconstricted, below convex, turgid in the center; aperture very oblique, regularly wide-oval, not angulate; peristome briefly expanded and reflexed, the margins not converging, joined by a callus, upper and lower equally curved, the latter with a rounded subthickened callus at its insertion, adnate to base, with a minute tubercle on the columella.

Diam. 21, alt. 14 mill.

Ins. Hierro, Canaries.

An unfigured fossil species, described from a single specimen, and said to be intermediate between *H. hierroensis* and *H. guamartemes.*

H. GUADRYI d'Orbigny, 1839. Pl. 50, figs. 75, 76.

Imperforate, thick, convex orbicular, spire slightly elevated, apex reddish, last whorl rounded, angular at its origin, abruptly descending and slightly gibbous at its termination, and strongly constricted behind the peristome, more or less irregularly striate, malleate and covered with a very fine granulation, visible only under a lens; bands five, slightly interrupted; aperture oval, peristome thick, callus, reflexed, labiate; basal margin callous, with a lamella inside, covering the umbilicus with a well developed callus.

Diam. 22, alt. 15 mill.

Ins. Gomera (d' Orbigny); Grand Canary.

Two varieties are described by Mabille: Var *evergeta*, differing from the type in the very depressed dull shell, and less thickened peristome, and var. *gaudryopsis* remarkable for its small size, solid shell, and more marked angulation. A small form is figured (pl. 50, figs. 77, 78) of which Pfeiffer says, "*evidentur diversa species!*" but which may be identical with the second of Mabille's varieties.

H. GRANOMALLEATA Wollaston, 1878. *Unfigured.*

"Imperforate, depressed globose, rather thin, obliquely plicate-malleate, the folds very irregular, subconfluent, and minutely very densely granulate with sand-like grains; above opaque, base smoother and shining in the center, grayish yellow, with four or five castaneous bands, the subsutural more or less interrupted or indented around its anterior margin, either one or two below the periphery, and a broader band (perhaps composed of two) immediately above it; spire obtuse; suture simple, impressed; whorls 5, slightly convex, the last large, inflated, obsoletely carinated at its origin, anteriorly deeply deflected; aperture large, lunate-oval; peristome acute but little expanded and reflexed, superior and basal margins subequally arcuate, simple, not dentate within, the terminations distant, but subconverging, joined by a callus.

Diam. 25 mill." (*Wollaston.*)

Los Souces and Barranco de Herradura, Ins. Palma, Canaries.

H. VERMIPLICATA Wollaston, 1878. *Unfigured.*

Partly covered umbilicate, orbicularly depressed, rather thin, very densely and coarsely vermiculate-plicate, the folds very irregular, submalleate-confluent, and very minutely granulate, subopaque, grayish white, with four or five obsolete cloudy bands, one or two below, one or two immediately above the periphery, and one just below the suture; spire obtuse; suture impressed; whorls 5, the last large, inflated, but with a minute carina, descending anteriorly; aperture lunate-rounded, terminations of the peristome remote.

Diam. 19 mill.

"Llanos" of the Banda, West side of Ins. Palma, Canaries.

Described from immature examples. Wollaston says: "I feel almost confident that the character of 'semiobtecta perforata' will be found to hold good during all periods of growth; and such being the case, its affinities, which at first sight are not readily apparent will perhaps be ascertained to lie amongst the forms around the *H. planorbella*, though, at the same time, the species has evidently something in common with the (equally Palman) *H. granomalleata*. Not to mention this peculiarity of the umbilicus, the present species is smaller than *H. granomalleata*, and it is also rather more depressed both above and below, and it has a fine thread-like though minute keel which is traceable even down to the very aperture. It is not *much* malleated,—its sculpture consisting mainly (apart from the excessively minute sand-like granules) of extremely irregular and

densely-packed, coarse, subconfluent oblique ridges, or subundulating vermiform folds; and in color it would seem to be of a dingy olivaceous-white, suffused with a darker tint in consequence of the four or five obsolete bands which are indistinctly indicated."

Mabille considers this form a variety or monstrosity of *H. planorbella.*

H. AMBLASMODON Mabille, 1883. Pl. 48, figs. 17, 18.

Imperforate, depressed-orbicular-convex, thick, solid, scarcely shining, yellowish fulvous, with four dark black-spotted bands, irregularly costulate-striate, here and there, especially below, with decurrent lines, under the lens all over finely granulate; whorls 5, very rapidly increasing, separated by rather deep suture; body-whorl large, compressed-rotund, rapidly descending and slightly gibbous at aperture, scarcely gibbous at aperture, scarcely constricted; aperture oblique, lunate, irregularly oblong, peristome thick, reflexed, acute, violaceous, margins subapproximating, joined by a very thin violet callus, basal margin straightened, lengthily adnate, with a strong impressed umbilical callus, tortuous columella, and a white, saliant, tortuous lamina inside. Diam. 26, alt. 13 mill.

Ins. Grand Canary.

Resembles *Macularia balearica* somewhat in the maculated bands.

H. ZORGIA Mabille, 1883. Pl. 49, figs. 27–29.

Imperforate, solid, depressed-orbicular-subglobose, slightly transparent, yellowish, with four brown bands, interrupted with yellow, irregularly costulate-striate, under the lens finely granulate and very superficially malleate; spire depressed-convex, apex minute, rugose, rufous; whorls 5–5½, rapidly increasing, separated by linear, obscurely margined sutures; body-whorl slightly angled at its origin, becoming rotund, a little turgid at the aperture, lightly constricted, subabruptly, rapidly descending; aperture oblique, lunate, oblong-rhomboid, margins subapproximating; peristome violet-tinted, subthickened, reflexed, obtuse, basal margin straightened, adnate, with a prominent white lamina inside, and a wide impressed callus over the umbilical tract. Diam. 24, alt. 12½ mill.

Ins. Grand Canary.

The more prominent characters are the very solid shell, yellow ground color, with wide, frequently interrupted, reddish-brown bands, the thick violet colored peristome, and strong basal tooth.

H. PLANORBELLA Lamarck, 1822. Pl. 61, figs 5, 6.

Umbilicate, orbicularly depressed, costulately striate, the costæ arcuate, acute, smooth, thinner on the base, pale yellowish corneous, trifasciate with gray, the first band subsutural, the second double, just above, the third just below the periphery; spire slightly convex, regular, apex flattened; suture slightly impressed; whorls 4½, slightly convex, subtumid near the suture, the last abruptly briefly descending, obtusely angulate, constricted at the aperture, convex, subinflated below, whitish in the umbilicus; aperture very oblique, circularly-oval; peristome subacute, slightly reflexed, thickened with white within, the margins much converging, joined by a thin callus, the right margin arcuate, basal much thickened, appressed in the middle outside, sub-straight within, columellar margin wide and flatly callously reflexed. Diam. 20, alt. 10 mill.

Ins. Teneriffe and Gomera, Canaries.

H. strigata var. *β*, Fér., and *H. villiersii* d'Orb. (pl. 64, figs. 6–8) and of Reeve ? (pl. 61, fig. 12,) are synonyms.

"According to Mousson, *H. planorbella* presents two totally distinct forms,—one of them peculiar to Gomera, with the costæ simple or ungranulated, which he believes to correspond with the Lamarckian type, and the other, which is more depressed and keeled, and has the ridges distinctly sculptured, to Teneriffe. This latter phasis, figured by Pfeiffer as the normal state of the *H. planorbella*, Mousson treats as a Var. *incisogranulata* (pl. 61, fig. 7–10), and defines it thus: 'umbilicus slightly narrower; plicæ less numerous, minutely granulate by transverse incised lines; basal margin less adnate, less thickened, distinctly convex within.' " (*Wollaston.*)

I have followed Mousson's identification of this species, and as I have no specimens, have taken my description from his. Mabille, however, whose work on *Hemicycla* is more exhaustive than any other, and who is *par excellence, analytical* in his methods, considers the "var. *incisogranulata*" the true *planorbella.*

His note on this point, (under *H. quadricincta, Nouv. Arch. du Mus. d'Hist. Nat.*, 1885, p. 24,) is as follows: "Dans le planorbella, les stries costulées sont incisées exactement comme celles du plicaria; le caractére que signale M. Mousson n'est réel qu'autant que l'on a en vue une variété de cette espéce a cotes lisses, variété qui nous semble assez rare, et pourrait peut-etre, lorsqu'elle aura été suffisamment étudiée, constitutuer une especе distincte" I am unable to decide upon the identity of a species upon which specialists on this fauna hold such diverse opinions.

H. INUTILIS Mousson, 1872. Pl. 50, figs. 3, 74.

Umbilicate, convex-orbicular depressed, strongly obliquely costate, the ribs cut into granules by incised lines, interstices striate, pale brownish, unicolored, lighter below; spire obtuse conic, apex striatulate, suture impressed, not margined; whorls 4½, subconvex, scarcely turgid near the sutures the last abruptly descending, transversely inflated and strongly constricted, with an evanescent angle, rounded below; aperture very oblique, rounded-oval, white; peristome acute, broadly flatly reflexed, sublabiate within, the margins scarcely separated, joined by a thin callus, the basal straightened in the middle, not adnate, sub-duplicate within. Diam. 17, alt. 9 mill.

Ins. Teneriffe, Canaries.

Resembles *H. plicaria* in sculpture and aperture, but with an umbilicus like *H. planorbella.*

H. PLUTONIA Lowe, 1861. Pl. 61, figs. 1, 2.

Partly covered umbilicate, subglobose-depressed, solid, above striate and with oblique series of granules (like hair scars and rather sparce), brownish, periphery obtusely angular, in the young acutely carinated, subciliate, below nearly smooth, whitish; spire slightly elevated, apex minute, very finely granulate-rugose; suture carinato-marginate, impressed at the last whorl; whorls 6, the upper flattened, the last somewhat descending, slightly convex below the suture, moderately convex below; aperture oblique, lunate-oval, submargaritaceus-white within; peristome slightly thickened, white, its margins remote, subconverging, parietal callus slight or absent, the upper narrowly, the basal strongly reflected, dilated near its insertion, half covering the umbilicus. Diam. 25, alt. 12–13 mill.

Ins. Lanzarote and Fuertaventura, Canaries.

H. SEMITECTA Mousson, 1872. Pl. 61, figs. 98, 99.

Partly covered perforate, convex orbicular-depressed, strongly irregularly striate and granulate, shining, whitish, with four brown bands, three above, one below the periphery, interrupted by angular white maculations, nearly destitute of cuticle; spire depressed-conic, apex flattened, finely rugose-granulate; suture subimpressed, subirregular; whorls 5, slightly convex above, the last somewhat depressed, not angulate, briefly descending anteriorly, slightly gibbous and constricted, base not granulate in the middle, rounded toward the umbilicus, which is one-ninth of the diameter; aperture very oblique, small, rounded oval; peristome obtuse, a little ex-

panded and reflexed, its margins subconverging, equally curved, the lower appressed in the middle, not impressed at the insertion, callous, half covering the umbilicus. Diam. 23, alt. 14 mill.

Ins. Gomera, Canaries.

A species allied to *H. planorbella*, but without trace of angle on the body-whorl. It has been found only in a fossil state.

H. PAIVANA Morelet, 1864. *Unfigured.*

Umbilicate, orbicularly depressed, obliquely granulate-striate, yellowish or greyish brown, with four interrupted bands; suture impressed; whorls 5, slightly convex, the last carinate above, deflexed anteriorly, turgid below; aperture very oblique, transversely oval, expanded slightly within, columellar margin dilated; umbilicus half covered. Diam. 24, alt. 11 mill. (*Morelet.*)

Ins. Gomera, Canaries.

This is not the *paivana* of Lowe (1861) which=*H. modesta* Fér. On account of this preoccupation, Mabille proposes the name *paivanopsis* for this species.

"The *H. paivana* is a rather depressed but obtuse shell there being no indications of a regular keel; its spire is only slightly raised, but somewhat blunt and dome-shaped; and its umbilicus is partially visible, it being only half closed-over (or perhaps rather more) by the reflexed peristome. It is somewhat thin in substance, tumid beneath, and of a yellowish brown hue, paler below but ornamented with four narrow and regularly interrupted darker bands, which give a somewhat freckled appearance to the whole upper side; and the surface is beset with coarse tubercles (which become obsolete toward the nucleus, and gradually disappear on the umbilical area), —caused by the breaking-up of the densely-packed oblique lines of growth." (*Wollaston.*)

H. QUADRICINCTA Morelet, 1864. Pl. 53, figs. 24–26.

Umbilicate, depressed, lenticular, acutely carinate, costulate or plicate striate, yellowish corneous, with four castaneous bands, one peripheral, another below, the balance upon the upper surface; whorls 5, slightly convex, the last anteriorly deflexed, base subturgid, aperture very oblique, transverse oval; peristome thickened, white, outer margin expanded, columella dilated, appressed, subdentate; umbilicus small, pervious, half covered. Diam. 19, alt. 8 mill. (*Morelet.*)

Ins. Gomera, Canaries.

The very depressed, lenticular form, convex base, conspicuous but not compressed nor filiform carina, and *smooth*, regular costations, readily separate this species from its allies.

H. SAPONACEA Lowe, 1861. Pl. 50, figs. 65–67.

Covered perforate, orbiculate-depressed, solid, striate and densely minutely granulate, shining, above yellowish corneous, narrowly trifasciate with brown, smoother and paler below, umbilical tract whitish, spire slightly convex, apex minute granulate, suture lightly impressed; whorls 4½, rather slowly increasing, the last depressed, obsoletely angulate at periphery, constricted and abruptly falling anteriorly, somewhat convex below; aperture very oblique, subquadrate-lunar, livid within; peristome heavily white-labiate, margins subparallel, remote, hardly converging, basal margin straightened, widely reflexed and adnate, covering the umilicus.

Diam. 17–18, alt. 8–9 mill.

Ins. Grand Canary.

H. PSATHYRA Lowe, 1861. Pl. 50, fig. 79.

Imperforate, depressed, thin, fragile, obliquely striate, brown or corneous-greenish, with four or five ill-defined brownish bands; spire slightly elevated, apex obtuse, suture impressed, submarginate; whorls 5, rather flattened, regularly increasing, the embryonic minutely granulate, the last with fine irregular incremental striæ and faint malleations, periphery obsoletely angulate, anteriorly subinflated and profoundly deflexed; aperture very oblique, subdeltoid-oval; peristome thin, fragile, broadly expanded, the margins subconverging, basal reflexed, rather straightened, dilated at the insertion, and broadly adnate above the axial region.

Diam. 22–24, alt. 12–14 mill.

Ins. Grand Canary.

H. THESPESIA Mabille, 1882, Pl. 48, figs. 19, 20.

Imperforate, depressed-suborbiculate, thin, a little shining, under a lens broadly costulate-striate and irregularly crispate-malleate, corneous-reddish or greenish; spire subdepressed, apex subacute, obscurely punctulate, reddish; whorls 4½–5, slightly convex, subregularly, rapidly increasing, suture impressed, obscurely albomarginate; body-whorl at its origin angulate-rounded, becoming rotund, slightly descending, a little inflated beneath; aperture oblique, lunate, transversely oblong-ovate, margins subdistant; peristome acute, briefly reflexed, thickened with white within, margins

subparallel, the columellar lengthily adnate, broadly expanded, covering the umbilicus with a white callus.

Diam. 18–19, alt. 10 mill.

Canary Is.

Allied to *H. saponacea*, but distinguished by the less depressed form, more elevated spire, more rapid increase of the whorls, less developed peristome, etc.

H. BITUMINOSA Mabille, 1883. Pl. 48, figs. 96, 97.

Depressed, subglobose, thin, subfragile, slightly shining, irregularly costulate-striate, especially on the last whorl, and superficially malleate, all over, under a lens minutely punctulate, intensely black, the apex reddish; spire a little convex, apex minute, rugose granulate; whorls 5–6, regularly increasing, separated by a slightly impressed suture, the last large, convex-rounded, obscurely angled at the periphery, toward the aperture gibbous, briefly descending, slightly constricted behind the peristome; aperture wide oblong-ovate, oblique, lunate, fauces violaceous, margins subconverging; peristome thin, vivid violaceous, labiate, outer margin well arched, columellar subconcave, with a slightly prominent white lamina.

Diam. 23–25, alt. 13, 14 mill.

Ins. Grand Canary.

H. MERITA Mousson, 1872. *Unfigured.*

Imperforate, convex-orbiculate, rather distinctly moderately striate and obscurely rugulose, irregularly granulate, shining, yellowish-white, trifasciate with brown; spire obtuse, depressed conic, apex flattened, very finely rugulose; suture subimpressed, not marginate; whorls 4½–5, the upper flattened, rapidly increasing, carinate, the last abruptly descending, subturgid at sutures, convex below, subangulate, the angle disappearing on the last portion, which is subgibbous and constricted; aperture oblique, transversely subquadrate-rounded, corneous; peristome obtuse, briefly expanded, margins distant, scarcely converging, joined by a callus, the basal straightened, elongate-subdentate in the middle, appressed and adnate. Diam. 27, alt. 16 mill.

Ins. Gomera, Canaries.

Form more conic, and at the same time more depressed than its allies. Only found fossil.

H. HARMONICA Mousson, 1872. Pl. 61, fig. 11.

Imperforate, subglobose-depressed, rather solid, widely costulate-striate, very minutely and indistinctly elongate-granulate, yellowish whitish, deeper colored above, bifasciate with pale brown below; spire obtuse, somewhat convex, nucleus flattened, minutely granulate, corneous; suture slightly impressed narrowly margined with white; whorls 4½–5, the last depressed rotund, a little descending, subinflated below; aperture very oblique, showing the bands within, lunate wide-oval; peristome obtuse, white, shortly reflexed, the margins a little converging, the basal less curved than the upper, appressed to the base. Diam, 22, alt. 14 mill.

Ins. Hierro, Canaries.

H. GOMERENSIS Morelet, 1864. Pl. 61, figs. 3, 4.

Covered perforate, depressed, thin, subtranslucent, corneous brown, with three dark bands, one near the suture, one above, the other below the periphery; spire depressed conic, obtuse; suture well marked; whorls 4, apex planulate, nearly smooth, whorls gradually increasing except the last, which widens very rapidly, especially toward the aperture; sculpture of very minute granules all over, and fine irregular oblique striæ; body-whorl angular at its origin, becoming rounded and somewhat tumid below toward the aperture, gradually descending anteriorly; aperture very oblique, large, transversely oval, slightly lunate; peristome thin, acute, its margins converging, the upper and lower equally arched, columella scarcely thickened within, rounded, reflexed and adnate on base, with a white callus over the indented umbilical region.

Diam. 21, alt. 12 mill.

Ins. Gomera, Canaries.

H. THORYNA Mabille, 1882. Pl. 46, figs. 66, 67.

Imperforate, convexo-depressed, subfragile, thin, subopaque, not shining, greenish tinged with rufous, with three faint bands of the same color; spire convex, apex yellowish, obtuse, punctulate, whorls 5, flatly sloping, subregularly increasing, suture distinct, body-whorl large, subacutely carinated, rounded toward the aperture, the carina evanescent, and a little gibbous, very slightly constricted; aperture oblique, lunate, oblong-rotund; peristome subthickened within, acute, expanded, the margins converging, outer margin sinuous, well curved,

columellar somewhat thickened, appressed, concave, very decidedly callous at its insertion. Diam. 21–23, alt. 10 mill.

Ins. Teneriffe Canaries.

Smaller, thinner, more fragile than *H. hedeia*, aperture shorter, larger, peristome thinner.

H. HEDEIA Mabille, 1882. Pl. 49, figs. 35, 36.

Shell imperforate, wide depressed-subglobose, opaque, thick, not lustrous, rufous brown, with one to three faint brown bands, striate, the striæ granulose; spire subdepressed convex, apex obtuse, large, smooth; whorls 5, subregularly increasing, the first flattened, balance convex, separated by impressed sutures; body-whorl large, rounded, with a salient line at the periphery, compressed at the suture, obliquely turgid before the aperture slightly constricted, abruptly descending; aperture oblique, lunate, transversely suboblong; peristome thick, labiate within, well expanded, external margin arcuate, concave, appressed, with a long lamelliform scarcely salient tooth inside, strongly callous at its insertion. Diam. 25, alt. 12 mill.

Ins. Teneriffe, in forests at the feet of trees.

H. BERKELEII Lowe, 1861. Pl. 53, figs. 22, 23.

Closed perforate, depressed, sublenticular, acutely carinated, rather thin, obliquely irregularly rugose-striate, and asperate with large, irregular tubercles, last whorl rough, cinnamon colored, the granules light-colored, with two superior and one inferior brown band; spire slightly or scarcely elevated, apex minutely granulate; suture impressed; whorls 4–4½, the last rather flattened, abruptly deflexed anteriorly, base somewhat flattened, lightly granulate; aperture nearly horizontal, lunate-oval, shining and granulated within; peristome thin, white or brownish, the margins subparallel, slightly converging, the upper widely expanded, basal broadly reflexed, dilated and adnate over the umbilical tract.

Diam. 19–20, alt. 7 mill.

Ins. Grand Canary.

H. berkeleyi of Wollaston and of Mabille is the same.

The affinities of this rare species are with *H. quadricincta* Morelet, etc., not with *Iberus*, with which it has been grouped by authors, a subgenus which is not represented in the Canary archipelago.

H. DIGNA Mousson, 1872. Pl. 62, fig. 38.

Covered perforate, robust, depressed-conic, arcuately widely plicate-costulate, very minutely asperate, destitute of cuticle and

color; spire depressed-conic, regular, apex obtuse, white, suture not impressed, closely submarginate above; whorls 4½, sub-rapidly increasing, the upper slightly convex, smooth, the following plane, plicate, the last large, abruptly descending, subdilated, slightly convex, encircled by a scarcely undulating carina, more convex below, subinflated, smoother; aperture very oblique, angulate-ovate; peristome subacute, slightly labiate within, the margins converging, the basal deeply arcuate, briefly reflexed, columellar very short, broadly expanded over the umbilicus. Diam. 33, alt. 19 mill.

Ins. Gomera, Canaries.

This fossil form has no near allies. It has been placed by various authors in *Leptaxis*, *Lampadia* and *Iberus*. Mabille, however, groups it with *H. cuticula*, a form bearing even more resemblance to *Lampadia*. (= *Mitra* Albers.)

Section VI. Plebecula Lowe, 1852.

This section is confined to the Madeira Is. Its more prominent characters are the globose form and profound sutures. *Helicomela* Lowe, 1854, is a synonym.

H. punctulata Sowerby, 1824. Pl. 51, figs. 1–4, 98, 99.

Nearly covered perforate, globose, rather thin, chestnut colored, with a light corneous peripheral band, base corneous; with rather coarse incremental wrinkles, the whole surface covered with minute setigerous granules, base smoother; spire conic, slightly turreted; sutures impressed; whorls 5, the apical nearly plane, rugose, convex, the last inflated, rapidly widening, slightly descending anteriorly; aperture slightly oblique, narrow-lunar; peristome scarcely thickened; columella white, dilated and partly appressed over the umbilical chink. Diam. 15, alt. 13 mill.

Madeira Group, Ins. Porto Sancto and Southern Deserta.

The reddish brown color is sometimes suffused over the entire surface of the shell. Specimens nearly white are also found. The thinner more elevated form found on the little island of Southern Deserta (or Bugio) has received the name of var. *avellana* Lowe.

H. bowdichiana Férussac, 1819. Pl. 50, fig. 97.

Large, globose, covered subimperforate, solid, destitute of cuticle and color; the whole surface irregularly wrinkled, base smoother, above finely granulate; whorls 5, separated by profound sutures,

the last descending; aperture small, narrow-lunar; peristome slightly expanded and thickened. Diam. 23, alt. 23 mill.

Quaternary of Madeira.

H. vargasiana Pfr. is a synonym.

Peristome more thickened than in *H. punctulata*, and form more globose. These characters, together with the larger size and much heavier texture seem sufficient cause for the specific separation of the two forms.

H. NITIDIUSCULA Sowerby, 1824. Pl. 51, figs. 33–35, 19.

Narrowly umbilicate, depressed globose, rather thin, yellowish corneous or whitish, with three rich brown bands above: finely, irregularly wrinkled and minutely granulate, smoother below; spire low-conic, subacute; suture deeply impressed; whorls 5, convex, the last rapidly widening, slightly descending anteriorly; aperture oblique, rounded-lunar; peristome simple, its ends converging, joined by a light callus, columellar margin subreflexed, white, slightly impinging upon the umbilicus. Diam. 13, alt. 10 mill.

Ins. Madeira and Porto Sancto.

H. vulgata Lowe, is synonymous.

Var. GIRAMICA Lowe. Pl. 51, fig. 35.

Slightly larger than the type, with the two upper bands confluent, or the whole surface uniform dark brown.

H. anaglyptica Reeve (fig. 19), is a synonym.

H. CANICALENSIS Lowe, 1852. Pl. 52, figs. 72–74.

Narrowly umbilicate, depressed conic, destitute of cuticle or color, rather thickened, with fine, irregular incremental wrinkles, and somewhat, though very minutely, rugose; spire elevated, conic, the apex subacute; suture profound; whorls 5, convex, the inner gradually, the last rapidly increasing, descending anteriorly; aperture small, contracted above, oblique; peristome scarcely thickened, the terminations converging, the columellar margin about half covering the umbilicus. Diam. 11–12, alt. 10 mill.

Quaternary of Canical, Madeira.

Allied to the preceding, but more conical, with smaller umbilicus and aperture; found only subfossil.

H. LURIDA Lowe, 1851. Pl. 51, figs. 25–27.

Narrowly umbilicate, depressed, rather thin, brownish, with (usually two) subobsolete spiral bands of dark brown, light incre-

mental striæ and very minutely, densely granulate; spire low-conic; suture impressed; whorls 5, convex, the inner gradually, the last rapidly widening, slightly descending anteriorly; aperture slightly oblique, wide lunar; peristome scarcely thickened, rather abruptly shortly deflected above, ends approaching; columellar margin briefly reflexed, white, impinging upon the umbilicus.

Diam. 9, alt. 6½ mill.

Ins. Porto Sancto.

More depressed than any of the preceding forms.

H. HARTUNGI Albers, 1852. Pl. 51, figs. 20–22.

Umbilicate, subdepressed, striatulate, slightly shining, white, spire subelevated, apex minute, corneous; suture smooth, whorls 5½, slightly convex, the last wide, rotund, sensibly descending anteriorly; umbilicus narrow, pervious, equalling ⅕ the entire diameter; aperture oblique, depressed rotund; peristome labiate within, the margins converging, joined by a thin callus, the upper straight, basal subreflexed, the columellar dilated. Diam. 10, alt. 5 mill.

Ins. Porto Sancto.

I have not seen this species. It is evidently nearly allied to the preceding, but differs (perhaps) in the sculpture. My description is from Pfeiffer.

Section VII. LEPTAXIS Lowe, 1852.

Leptaxis inhabits the more outlying Atlantic islands, Madeira, the Azores and the Cape Verdes. There is considerable diversity of form among the species; and this has caused a part of them to be considered as belonging to Hemicycla, (a group restricted to the Canary Is.) and the remainder to be divided into several subsections, three of which I retain for convenience in identifying specimens.

Katostoma Lowe, 1864, and *Cryptaxis* Lowe, 1864, with *Lampadia* Lowe, 1854, (= *Mitra* Albers, 1850) are synonyms.

***

Leptaxis s. str. Axis imperforate; columella entering, or expanded at origin; whorls not acutely carinated nor widening with great rapidity.

A. Species with rounded periphery.

(Species of the Madeira Islands.)

H. UNDATA Lowe, 1831. Pl. 51, figs. 11, 12; pl. 52, fig. 75.

Imperforate, depressed turbinate, rather thin, uniform dark brown scarcely striate, but all over densely and very coarsely wrinkled,

the wrinkles more or less irregular, wavy, shining, more obliquely descending than the lines of growth; spire conic, more or less depressed, apex nearly smooth; suture well impressed; whorls 5½, convex, the inner gradually, the last rapidly widening, deeply deflexed anteriorly; aperture very oblique, regular rounded-lunar, wide; peristome slightly subexpanded and labiate, margins converging, the columella entering, briefly expanded and appressed over the umbilical tract. Diam. 24–30, alt. 16–20 mill.

Madeira.

H. corrugata (Soland. MSS.) Lowe, *H. groviana* Fér., and *H. scabra* Wood are synonyms.

H. VULCANICA Lowe, 1852. Pl. 50, figs. 95, 96; pl. 52, fig. 76.

Imperforate, depressed-conic, thin, greenish yellow, with two (subsutural and supra-peripheral) dark brown bands frequently interrupted by the lighter color; obliquely sculptured with coarse irregular wrinkles, base much smother; whorls 5, the inner gradually, the last rapidly widening, convex, apex slightly rugose; body whorl rather flattened, descending anteriorly; aperture oblique, regular rounded lunar; peristome slightly expanded and labiate, its ends converging, the columellar margin directly entering, slightly expanded. Diam. 23, alt. 14 mill.

Northern and Central Desertas, Madeira Is.

This species and the next are separated from *H. undata* by their variegated coloration and the much less coarse currugation of the surface, which, however, as in the *undata* is as obvious inside as outside, on account of the thin shell.

H. LEONINA Lowe, 1852. Pl. 51, figs. 23, 24; pl. 52, fig. 77.

Like *H. vulcanica*, but more globose and turbinate, the base more convex, mouth rounder, coloration deeper, the bands scarcely or not interrupted. Diam. 26–30, alt. 18–20 mill.

Southern and Central Desertas, Madeira Is.

Scarcely distinct from the last species.

H. NIVOSA Sowerby, 1824. Pl. 51, fig. 18; pl. 52, figs. 78–80.

Imperforate, globose-turbinate, yellowish-brown, generally with broad dark spiral bands, and a narrow light peripheral fascia, the whole surface sculptured with rather coarse oblique whitish wrinkles, and an excessively minute granulation; spire conic, subacute; suture well-marked; whorls 5, the last rapidly widening, full and well-rounded toward its termination, and deeply descending; aper-

ture very oblique, rounded oval; peristome simple, the terminations converging, the upper extended into a white callus, columellar dilated, straightened inside, pinkish. Diam. 15, alt. 12 mill.

Ins. Porto Sancto.

H. phlebophora Lowe and *H. exalbida* Wood are synonyms.

Var. CRATICULATA Lowe.

Smaller than the type, and darker, with very coarse corrugations. There is also a depressed form (*β. planata* Lowe) in which the body whorl is frequently carinate at its origin.

H. PSAMMOPHORA Lowe, 1852. Pl. 51, fig. 32.

Imperforate, turbinate-conic, destitute of cuticle or color, elegantly sculptured with irregular incremental wrinkles cut into rounded granules by fine and very numerous spiral impressed lines; last whorl very deeply deflexed anteriorly; aperture small, very oblique, rounded oval. Diam. 12, alt. 10 mill.

Quaternary of Ins. Porto Sancto.

Allied to the preceding, but distinguished from that and all other forms by the peculiar sculpture. The revolving lines are not sufficiently shown in the figure.

H. ERUBESCENS Lowe, 1831. Pl. 52, figs. 81–83.

Imperforate, globose, elevated or depressed, rather thin, whitish corneous, with oblique streaks of clear corneous, and usually spiral bands or series of blotches of rich dark brown; sculptured with incremental wrinkles and oblique anastomosing currugations; spire conic, elevated or depressed; whorls 5, slightly convex, the last convex below, indented at the center and descending anteriorly; aperture oval or rounded truncate, very oblique; peristome expanded, labiate with white; columella inserted nearly vertically, simple; umbilical tract covered by a white callus.

Diam. 14, alt. 10–14 mill. *Madeira Is.; St. Miguel, Azores.*

H. simia Fér., (pl. 51, fig. 28) is synonymous.

This species may be known under all its forms by the simple, thin deeply entering columella.

"The *H. erubescens* passes through an almost infinite number of changes both in outline and hue, as regards the latter scarcely two specimens being precisely alike. Sometimes the volutions are elegantly banded, at others some of the fasciæ are obsolete, and at others the latter are more or less broken up into tessellated fragments; while many individuals are concolorous, being entirely devoid of markings. The ground-color varies chiefly from a pale

pinkish-brown and yellowish-white into a dusty yellowish-gray; and there is generally (though by no means always) a rosy tinge about the peristome." (*Wollaston.*) The St. Miguel specimens were probably introduced.

Var. HYÆNA Lowe.

Large, coarsely sculptured, pale yellowish brown, the bands much broken. Diam. 20 mill.

Southern Deserta, Madeira Is.

The other varieties recognized by Wollaston, *porto-sancti* and *advenoides* are scarcely distinct enough for names. The former may be the same as *H. simia* Fér.

H. FURVA Lowe, 1831. Pl. 51, figs. 15–17.

Imperforate, depressed globose, thin, yellowish, with a peripheral interrupted dark brown band, roughened by incremental striæ and irregular reticulations or malleations, whorls 5, but slightly convex, separated by scarcely indenting sutures, gradually increasing, the body-whorl angular at its origin, becoming rounded, with tumid base, and descending anteriorly; aperture round-lunar, oblique; peristome simple; columella entering deeply and nearly directly. Diam. 17–22, alt. 12½ mill. *Madeira.*

Aperture less oblique and less deflected above than in *H. erubescens*, body-whorl angular at its origin, and coloration different.

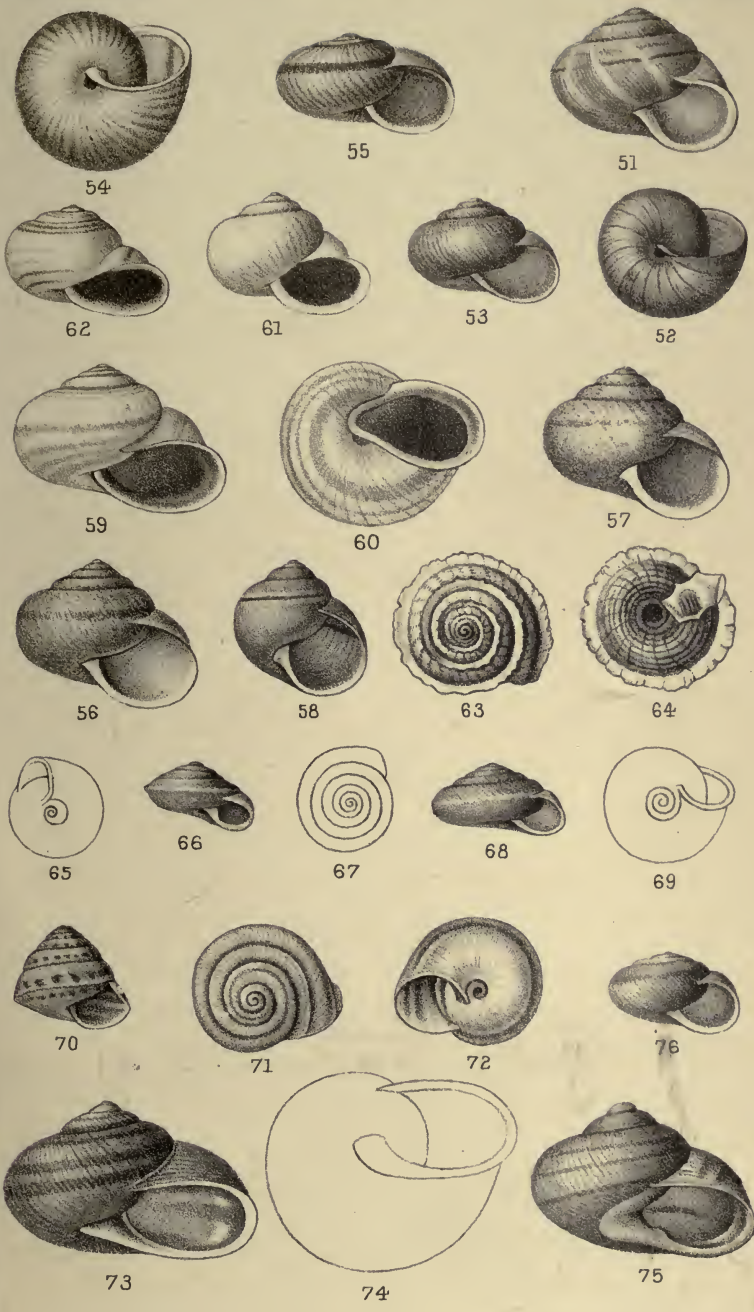
(*Species of the Cape Verde Islands.*)

H. ADVENA Webb et Berthelot, 1833. Pl. 50, figs. 92, 93; pl. 52, figs. 84, 85.

Imperforate, globose-depressed, rather thin, shining corneous with (about) five dark brown bands the upper ones wider, frequently coalescent, and interrupted by oblique light streaks densely irregularly sculptured with oblique striæ, and with almost obsolete spiral impressed lines; whorls 4, slightly convex, rapidly increasing the apex obtuse, dark, smooth; body-whorl gently and slightly descending anteriorly; aperture rounded lunar, oblique; peristome slightly expanded, its ends converging, the columella arched, and dilated and appressed over the umbilicus. Diam. 16, alt. 11 mill.

St. Antao and St. Vincente, Cape Verde Is.

This species has been confounded by some authors with *H. erubescens*, but is most readily separated by attention to the sculpture and the character of the columella, which has a wholly different insertion from that species. The spiral sculpture is shared with the following species; but in *advena* is so obscure as to be easily overlooked. The species never has so warm a color as *H. erubescens.*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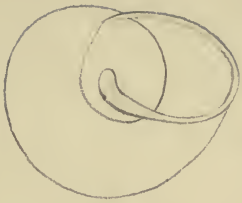
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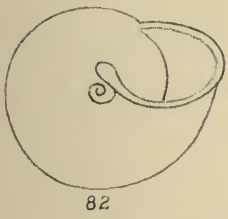
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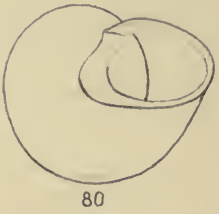
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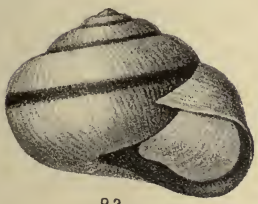
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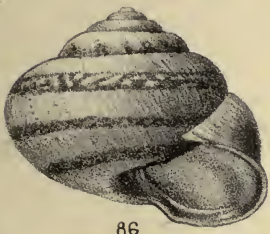
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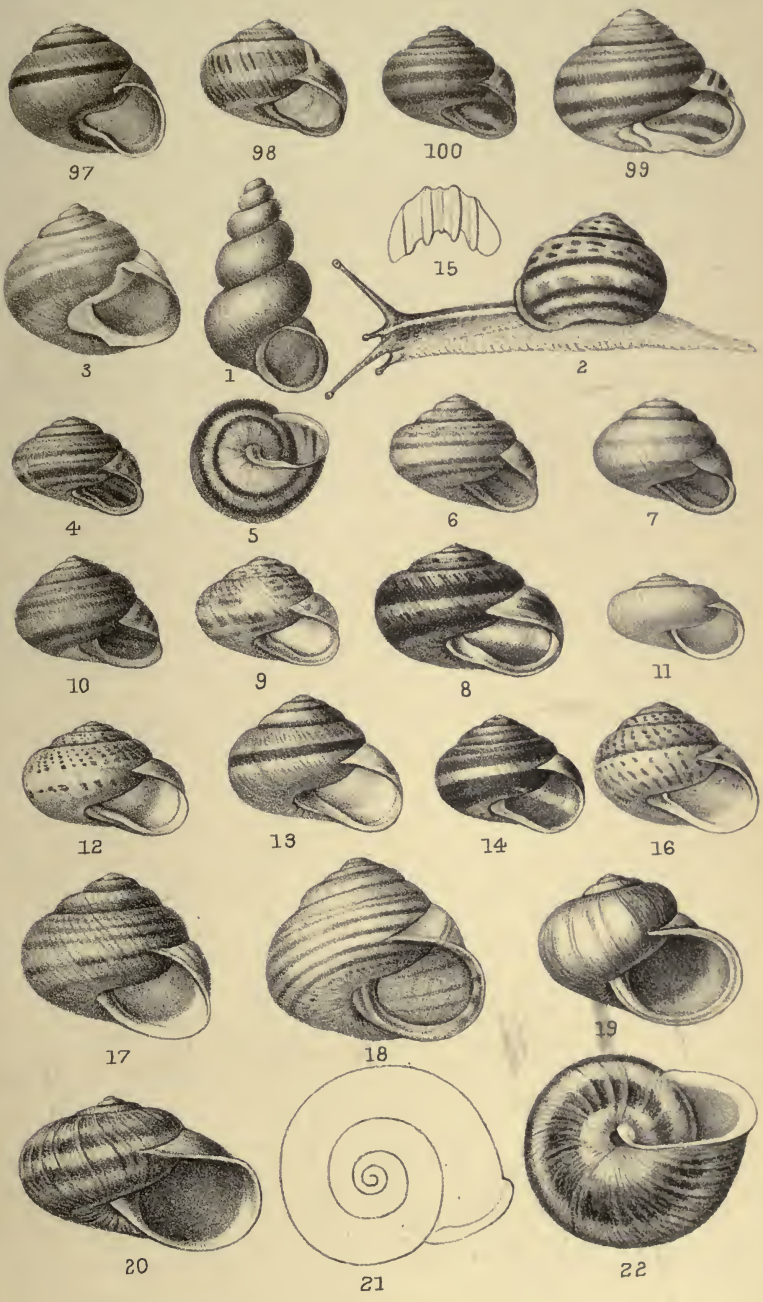
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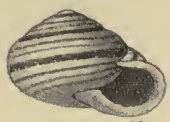
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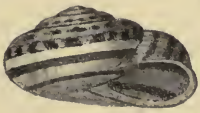
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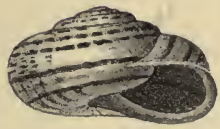
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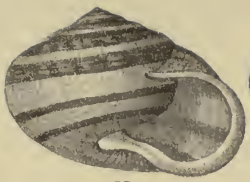
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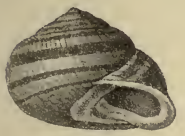
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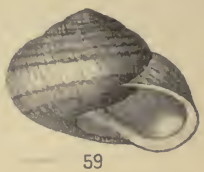
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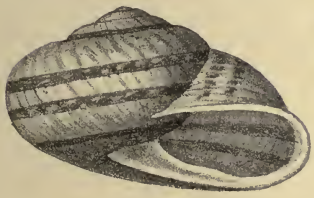
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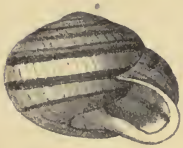
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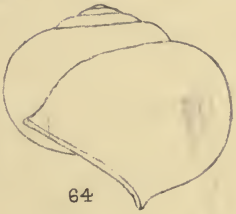
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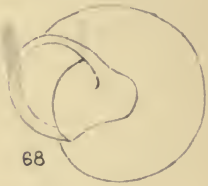
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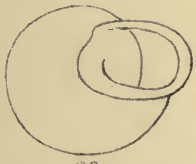
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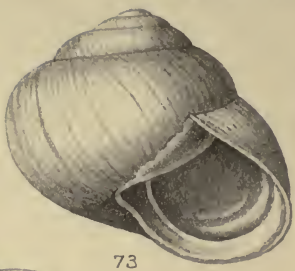
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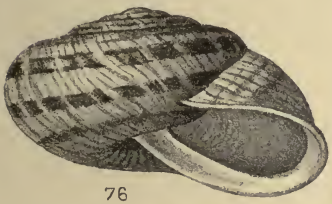
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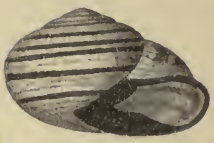
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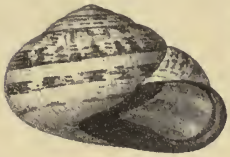
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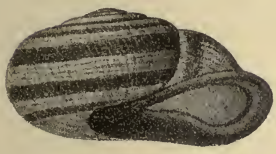
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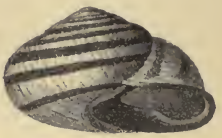
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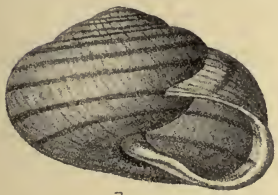
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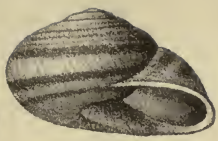
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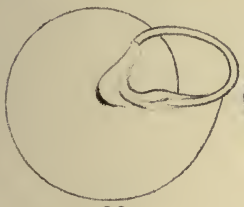
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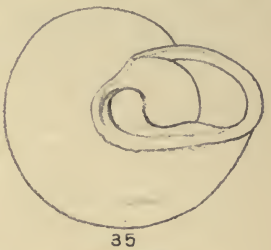
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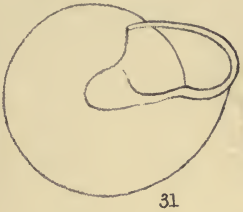
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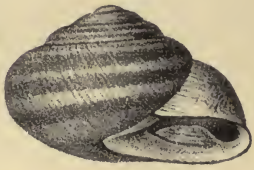
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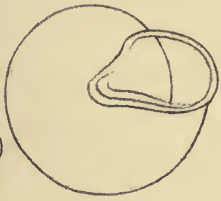
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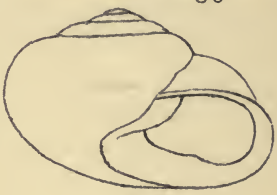
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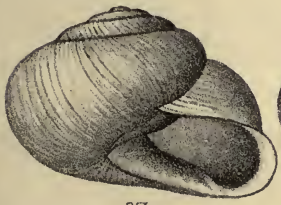
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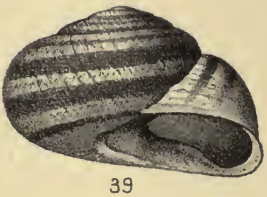
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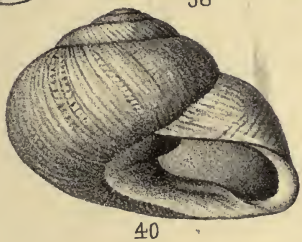
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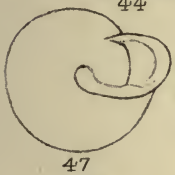
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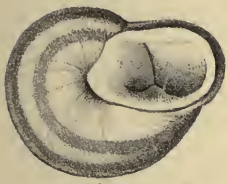
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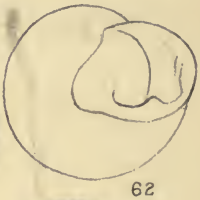
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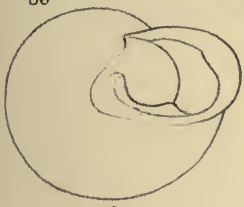
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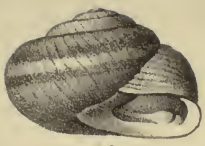
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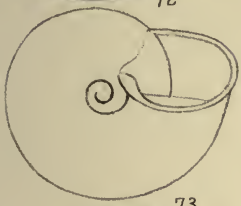
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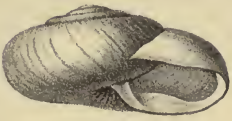
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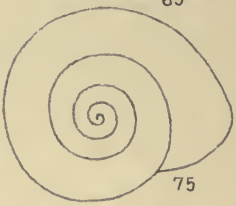
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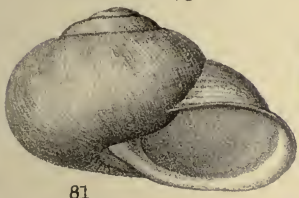
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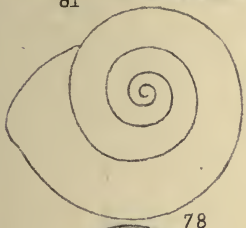
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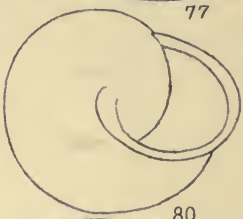
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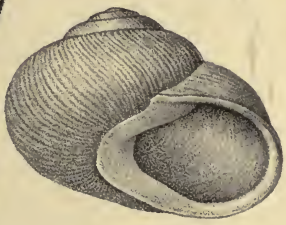
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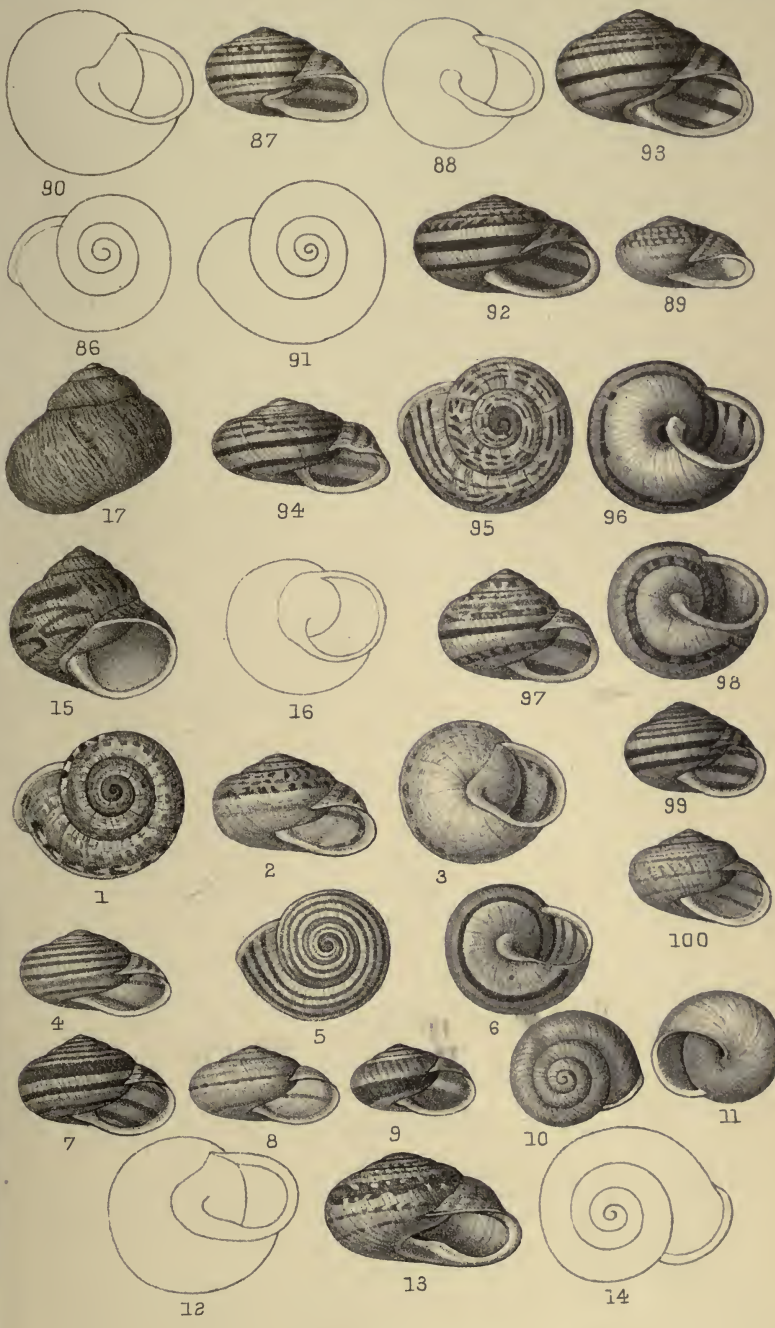
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H. SERTA Albers, 1854. Pl. 50, figs. 84, 85.

Similar to the preceding, but less strongly striate, and with much more variegated coloration; the brown bands are narrow, very irregular, much interrupted by patches and articulations of cream color. Diam. 16, alt. 11 mill. *St. Nicolas, Cape Verde Is.*

H. FOGOENSIS Dohrn, 1869. *Unfigured.*

"Covered umbilicate, subglobose, striatulate, shining, corneous yellow, with four brown bands, the first and second with central line of white; spire obtuse, conic; suture impressed; whorls 5, convex, the last rounded, descending anteriorly; aperture diagonal, lunate-rotund; peristome white, slightly expanded, margins converging, connected by a thin callus, columella reflexed over umbilicus, thickened. Diam. 17, alt. 14 mill."

Fogo and Brava, Cape Verde Is.

The following quotation from Wollaston may aid in the identification of the present species, which I have never seen.

"In its rather globose outline, dull hue, and uninterrupted bands, this Helix has somewhat the *prima fascie* aspect of the (nevertheless totally dissimilar) Porto-Sanctan *H. punctulata* Sow.; though in reality it belongs to an altogether different group. It is indeed closely allied to the H. visgeriana, as is evident, not merely from its general plan of coloring and from its umbilicus not being completely closed over, but likewise from the presence of the minute spiral lines which (under a high magnifying power) are everywhere visible on its surface. Specifically however, it is quite distinct,—it being not only larger and more globose, and of a uniformly duller tint, but likewise with the minute spiral lines (which look more like indistinct subundulating scratches) more irregular and obscure, and with the oblique transverse costæ well-nigh obsolete, and (such as they are) concolorous with the rest of the surface, the entire shell appearing comparatively smooth and unsculptured. Its umbilicus too, is a little less closed over, and its suture is very deeply impressed."

H. VISGERIANA Dohrn, 1867. Pl. 66, fig. 80c.

Covered perforate or nearly so, globose depressed, shining, corneous, with four or five narrow dark brown bands of which two are below the periphery, and which are frequently interrupted by regular strong oblique whitish striæ; revolving impressed lines visible chiefly in the interstices of the striæ; whorls 3½, slightly convex,

rapidly increasing, the last rounded, slightly descending anteriorly; aperture rounded lunar, oblique; columella well curved. expanded over the umbilicus. Diam. 12–15, alt. 8–10 mill.

St. Iago, Cape Verdes.

The present species differs from all the preceding in possessing stronger *spiral* as well as incremental striæ.

H. MYRISTICA Shuttleworth, 1852. Pl. 52, figs. 61–63.

Imperforate, depressed globose, shining, thin, brownish corneous with four narrow brown bands, which are frequently interrupted with light streaks and spots; sculpture as in H. visgeriana, composed of incremental striæ and very numerous delicately impressed spiral lines; aperture rounded, the columella straighter than in H. visgeriana; peristome thin, narrowly expanded, its columellar termination expanded and appressed over the umbilicus.

Diam. 18, alt. 13 mill. *St. Iago. Cape Verdes.*

This species has not before been figured. I am not sure of the relation it bears to *H. fogoensis*, (see above), but from the other larger species of the Cape Verde group, *advena* and *serta*, the much greater development of the spiral sculpture and the more globose form will separate it.

I am inclined to refer to this species as a variety, a form figured on pl. 52, fig. 64. It is different in coloration, lacking the narrow articulated brown bands of the type. Probably this is the *H. aranjoi* (or *arangoi*) Dohrn, a form never described or figured, and referred by Pfeiffer to *H. advena*. My figure indicates that it is carinated; this is not the case.

H. BOLLEI Albers, 1854. Pl. 51, figs. 53, 54.

Imperforate, depressed subglobose, thin, shining, subtranslucent, brownish, corneous, finely obliquely striate and *covered with an excessively minute granulation;* spire low, sutures scarcely impressed; whorls 4½, slightly convex, rapidly increasing, the last carinated at origin, the carina nearly disappearing toward the aperture, the base convex and slightly indented in the centre, above descending a little anteriorly; aperture oval lunar, oblique; peristome labiate with white, its columellar termination deeply entering, the axis covered by white callus. Diam. 11–13, alt. 7–8 mill.

St. Vincente and St. Nicholas, Cape Verdes.

Separated from all the preceding Cape Verdes species by the sculpture. The fragile texture and keel stretched around the periphery are also peculiar.

H. LEPTOSTYLA Dohrn, 1869. Pl. 66, fig. 80b.

This species has the form, sculpture and aperture of the preceding; but is thicker, larger, and has a tendency to be brown banded, the bands broad, faint, and minutely flecked with white. The peripheral keel is more obsolete, and indeed scarcely apparent save in front of the aperture. The body-whorl is somewhat more deflexed anteriorly. Diam. 13–15, alt. 10–12 mill.

St. Antao, Cape Verde Is.

H. milleri Dohrn mss. is a synonym.

H. PRIMÆVA Morelet, 1873. *Unfigured.*

Perforate, depressed turbinate, corrugated with large oblique folds; spire conoidal; whorls 4, convex, the last inflated, rounded, not deflexed; suture impressed; aperture ovate-lunar.

Diam. 18, alt. 11 mill. *Quaternary of Ins. Sal, Cape Verdes.*

The peristome was imperfect on the specimens from which Morelet's original diagnosis (above translated) was drawn. He compares the species to *H. undata* of Madeira.

H. ATLANTIDEA Morelet, 1873. *Unfigured.*

Imperforate, globose-depressed, densely and regularly costulate-striate; spire convex, smooth toward the aperture; whorls 3½, slightly convex, separated by impressed sutures, rapidly increasing, the last dilated, obtusely angulate, not deflexed; aperture ovate-lunar, ends of the peristome joined by a callus, the upper margin straight, the columellar callous, dilated, appressed.

Diam. 13, alt. 8 mill. *Quaternary of Ins. Sal, Cape Verdes.*

Somewhat similar to *H. chrysomela*, but a little more depressed, and with one and one-half whorls less than that species. The peripheral angle, which is quite pronounced at the origin of the body-whorl, is gradually lost on approaching the aperture.

H. SUBROSEOTINCTA Wollaston, 1878. *Unfigured.*

Imperforate, depressed-globose, scarcely subcarinate, a little shining, whitish, sometimes subfuscous, or very obsoletely almost subroseous, obsoletely and irregularly, (especially at the suture) streaked or smeared with sublacteous, the young subpellucid; whorls 5, slightly convex, the last slightly descending anteriorly; peristome

acute, distinctly rosy, margins separated; columella substraight, oblique, forming a slight angle at its junction with the basal lip.

Diam. 10–12, alt. 8 mill. *Ins. Brava, Cape Verdes.*

"The *H. subroseotincta* in its small size and totally ungranulated surface has more in common with the *H. bollei* than it has with the *leptostyla.* Nevertheless, it is thicker, whiter and more calcareous; its peristome has nearly always a faint rosy tinge (indeed the entire shell is often suffused with a faint rosy brown); its volutions, the basal one of which is not quite so perceptibly keeled, are a trifle more tumid, and the suture consequently somewhat more impressed; its columella is just appreciably straighter, forming somewhat of an angle at its junction with the lower lip; and its entire surface has a tendency to be irregularly blotched, or freckled, with very obscure paler, frequently confluent patches." (*Wollaston.*)

(*Species of the Azores Islands*)

H. AZORICA Albers, 1852. Pl. 51, figs. 5–8.

Imperforate, depressed-globose, very thin, transparent, faint golden, speckled with dots and short oblique marks of opaque whitish buff, and generally with traces of brownish faciation about the periphery, very delicately striate; spire short; suture moderately impressed; whorls 5, slightly convex, rapidly increasing, the last globose, convex, gently deflected anteriorly; base slightly indented at center; aperture rotund-lunar, as long as wide, oblique; peristome slightly thickened with white, ends remote; columella thin, deeply, vertically entering, well curved. Diam. 11–13, alt. 7–8 mill.

Sta. Maria and San Miguel, Azores.

H. CALDEIRARUM Morelet et Drouet, 1857. Pl. 51, figs. 39–41.

Differs from *azorica* in being of thicker texture, more decidedly striate, with more depressed body-whorl, and more conical spire. The surface is nearly free from opaque white markings; the whorls number nearly 6, and the increase in width is very gradual; the aperture is broader than long, the peristome labiate with white, the the collumella much more oblique than in *H. azorica;* the base is rather flattened, and decidedly indented in the center.

Diam. 11, alt. 7 mill.

San Miguel, Azores.

H. NIPHAS Pfeiffer, 1857. *Unfigured.*

Imperforate, globose-conic, solid, plicate-striate, white; spire convex-conic, apex obtuse; whorls 5½, slightly convex, gradually in-

creasing the last not descending; base slightly convex; aperture oblique, lunar, peristome straight, margins remote, the right short, simple, the basal sensibly thickened toward its insertion, and briefly ascending. Diam. 11, alt. 8 mill.

St. Miguel, Azores.

None but the original specimens (communicated to Pfeiffer by Mr. Cuming) are known. It seems to be near *H. caldeirarum* in form, but differs from all *Leptaxis* of the Azores in the solid texture. Pfeiffer's description is translated above.

H. TERCEIRANA Morelet, 1857. Pl. 51, figs. 36–38.

Imperforate, depressed-conoid, slightly solid, densely, rather rudely striate, and covered with an excessively minute granulation, corneous brown, variegated with maculations and streaks of opaque pale yellowish; whorls 6, somewhat convex, with well marked sutures, slowly widening, the last obtusely angulate; base somewhat flattened, indented in the center, anteriorly briefly descending; aperture oblique, ovate-lunar, peristome straight, margined within, slightly expanded, livid; outer margin acute, columellar callous, flattened, entering. Diam. 12, alt. 7 mill.

Ins. Terceira, Azores.

Allied to *H. caldeirarum*, but less diaphanous, more coarsely and roughly striate, and the columellar margin, toward its insertion, is broader, owing to the larger umbilical perforation covered by its expansion.

H. DROUETIANA Morelet, 1860. Pl. 51, figs. 29–31.

Imperforate, globose-conic, somewhat solid, rugose-striate, yellowish, variegated with corneous radiations and a blackish interrupted peripheral fascia; spire conic, apex rather acute; whorls 6, slightly convex, the last briefly descending; aperture ovate-lunar, marbled with white within; peristome obtuse, labiate, the superior margin scarcely expanded, the columellar flattened, entering.

Diam. 13, alt. 9 mill.

Ins. Fayal, Azores.

In this form the corneous surface is almost covered by the opaque yellowish-white markings (which in *H. azorica* only speckle the shell), the spire is conic, as in *H. caldeirarum*, and the shape of the base, which is indented in the center, is very similar to that species; the aperture is broader than long, and the peristome livid in color. The variegated appearance reminds one of *H. erubescens;* and the illusion is increased by a very slight malleation.

H. EXORNATA Deshayes. Pl. 51, figs. 13, 14.

Subglobose, somewhat depressed, smooth, pale yellow, with white zones, ornamented with two black undulate-angular zones at the periphery; spire short, obtuse, convex; whorls 4, slightly convex, wide, rapidly increasing, the last large, convex, slightly depressed below, imperforate, obliquely deflexed at the aperture; aperture large, oblique, rotund-lunar; peristome white or yellow, thickened within, reflexed, the base marked with a wide rosy spot.

Diam. 14, alt. 10 mill.

Habitat unknown.

This form is known only by the description of Deshayes which is translated above, and the original figures, copied on my plate. I follow Pfeiffer in referring it to *Leptaxis;* but of course any subgeneric reference, without more information than we possess regarding it, is little better than guess-work.

(*B. Species with carinate periphery.*)

H. CHRYSOMELA Pfr., 1848. Pl. 51, figs. 50–52.

Imperforate, depressed, destitute of cuticle, chalky white, with wrinkles of increment, rugose, malleated; whorls 5, flattened, gradually increasing, the last angled at its origin, becoming almost rounded, very briefly but abruptly descending anteriorly; aperture very oblique, slightly contracted, truncate-oval, the upper and lower margins subparallel, peristome reddish orange colored; columellar margin very obliquely descending, broad, straight within.

Diam. 10, alt. 6 mill.

Quarternary of Porto Sancto.

H. œnostoma Lowe is a synonym.

Var. FLUCTUOSA Lowe, 1852. Pl. 52, fig. 86; Pl. 51, figs. 9, 10.

This form differs from *H. chrysomela* in being larger, more acutely carinated, and with whorls less rounded above. The peristome is white, and is less thickened internally on the columellar margin than in the type. Diam. 14 mill.

H. VETUSTA Morelet et Drouet, 1857. Pl. 66, fig. 80a.

Imperforate, conic, rather solid, cretaceous white, (or rarely variegated with corneous) with two reddish brown bands, usually interrupted or subobsolete, obliquely striate, and with a tendency to be still more obliquely, finely undulate; whorls 6–6½, carinate in the middle, slowly widening, flattened above, the last a trifle more con-

vex above, acutely carinated, briefly deflexed anteriorly; base somewhat convex, not indented in the center; aperture very oblique, slightly broader than long, truncate oval; peristome labiate inside, pink-tinted, its terminations not converging; columellar margin thickened, somewhat flattened, appressed; parietal wall covered by a pinkish callus. Diam. 15–19, alt. 11–12 mill.

Quarternary of Sta. Maria, Azores.

This species seems to most nearly allied to the *H. chrysomela* of Porto Sancto, but may be readily seperated by its sculpture, large size, conical spire and acute peripheral carina.

H. WOLLASTONI Lowe, 1852. Pl. 51, figs. 59–60.

Imperforate, depressed conic, rather solid, carinate, dark yellowish or olivaceous-brown, with, usually, two spiral darker bands; obliquely plicate-striate, and covered with a minute granulation; spire usually depressed, the apical whorl smooth; whorls 5, nearly planulate the last 2 rapidly widening; body-whorl acutely carinated, deeply descending anteriorly; base convex, not indented at the center; aperture transversely oval, angular at the extremities, very oblique; peristome a little expanded, usually pinkish, nearly continuous over the parietal wall; columella somewhat dilated, flattened, entering. Diam. 22, alt. 11 mill.

Ins. Porto Sancto.

Probably more nearly allied to *H. nivosa* than to the species with which on account of its carinate periphery, it is here associated.

Var. FORENSIS Wollaston.

A smaller form than the type, in which the aperture is rounded at the outer margin, scarcely modified by the peripheral keel; the parietal wall is traversed by a very heavy callus which joins the lips; and the inner two or three whorls of the spire usually are prominent, as if mamillated. Diam. 17, alt. 9½ mill.

Described as a species by Mr. Wollaston, but the specimens before me are too similar to *wollastoni* to be separated.

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2. *Pseudocampylæa* Pfr. Axis umbilicate; aperture oval, the lips expanded, converging.

H. PORTOSANCTANA Sowerby, 1824. Pl. 52, figs. 87–89.

Umbilicate, depressed, rather strong, corneous yellow, with three brown bands, the upper two generally broad, often coalescent; surface marked with rather strong, irregular incremental wrinkles, all

over minutely punctate; whorls 5½, convex, the inner smoother, gradually, the outer more rapidly widening; body-whorl depressed, rounded at the periphery, flattened above, deeply deflexed anteriorly; aperture very oblique, perfectly oval; peristome expanded, brownish, continued as a heavy callus over the parietal wall, its basal portion subreflexed, partially concealing the umbilicus.

Diam. 23–30, alt. 13–15 mill.

Ins. Porto Sancto.

H. LOWEI Férussac, 1835. Pl. 52, fig. 90.

Differs from the preceding (of which it may be a variety) in the much larger size, the less obviously punctate surface, less oblique aperture and narrower revolving bands, of which there are but two, and these very slender. Diam. 45–55 mill.

Porto Sancto.

This largest of the Atlantic species is quite abundant in the quarternary deposits of Porto Sancto, but according to Wollaston, only a single specimen has been found alive. It seems to be replaced in the living fauna by the very similar but much smaller *H. portosanctana.*

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3. *Lampadia* Lowe. Imperforate; vitrina-shaped, the whorls thin, carinate, and very rapidly increasing; aperture very large.

Mitra alb., preoc., is a synonym.

H. WEBBIANA Lowe, 1831. Pl. 51, figs. 55, 56.

Imperforate, depressed, carinated, very thin, uniform olivaceous brown, lighter below, with oblique irregular incremental striæ and a rather coarse granulation which is confined for the most part to the central portion of the whorl, above and below the carina, and to the neighborhood of the aperture, and which, although usually quite obvious to the naked eye is frequently subobsolete; whorls 3, very rapidly widening, scarcely convex above, the last convex below, bearing a compressed carina at the middle, and slightly descending anteriorly; aperture very oblique, oval, slightly angled at the place of the carina; peristome expanded, thin, its extremities not connected, columellar margin thin, entering, slightly reflexed and appressed at the axis. Diam. 19, alt. 10 mill.

Porto Sancto, Madeiras.

Vitrina bocagei Paiva (pl. 51, figs. 57, 58) is a young shell of this species.

H. MEMBRANACEA Lowe, 1852. Pl. 51, figs. 45, 46.

Imperforate, depressed globose, excessively thin, flexible, pellucid, yellowish or greenish corneous, usually more or less variegated with opaque whitish flecks and reticulations, which sometimes form a stripe at the central keel; whorls 4, rapidly increasing; spire low, obtuse; body-whorl acutely carinated at the middle, the carina becoming obsolete toward the aperture; not deflected anteriorly; aperture large, broad oval lunar, oblique; peristome simple, thin, ends scarcely converging; columella simple, arcuate.

Diam. 10, alt. 6 mill.

Madeira.

The excessively thin, easily indented substance of this species will distinguish it from any of its allies. The last whorl is not so acutely carinated as in *H. webbiana*.

H. CUTICULA Shuttleworth. Pl. 51, figs. 47–49.

Imperforate, depressed-conic, very thin and fragile, with a silky lustre, light green, costulate-striate; spire low, conic, apex prominent; suture impressed; whorls 3, rapidly increasing, convex below the sutures and on base, but concave above and below the prominent peripheral carina; body-whorl large, depressed, carinated to the aperture, not deflected anteriorly, indented at the axis; aperture transversely oval, angulate at position of carina; peristome acute, membranous; columella deeply, vertically entering.

Diam. 7, alt. 4½ mill.

Teneriffe and Palma, Canaries.

Section VIII. IBERUS Montfort, 1810.

Helices of the section *Iberus* are very numerous, both in species and individuals in central and southern Italy, and in Sicily; and curiously enough, there have been a few trans-Mediterranean species discovered in recent years. There is great lattitude of opinion concerning the synonymy of the group, arising from the fact that transition forms between many of the "species" render any hard-and-fast lines of demarkation between them wholly arbitrary; and the subject has been still further complicated by a number of diagnoses of "new species," without figures, each of which admits of being applied to several forms.

The Sicilian species form a perfect series of gradations between the carinate flattened forms and the globose elevated ones. They

differ from most of the peninsular species in being marked with minute spiral impressed lines. The Italian species are generally more depressed, and more deeply colored.

Montfort's type of *Iberus* is not *H. muralis* as I stated on p. 122 (following Albers and v. Martens) but *H. gualteriana* of Spain. There may be two subsections recognized: *Iberus, s. str.* and *Levantina* Kobelt, the latter comprising the large forms of Asia Minor.

The synonymy includes *Murella* Pfr., and, in part, *Crenea* Albers. Pfeiffer and other authors have included, also, a number of Canary Island species, which in this work are placed in *Hemicycla*.

IBERUS, *s. str.*

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A. Iberus of depressed and carinated, or rounded globose form, the base convex, imperforate. Sicilian, African and Spanish species.

H. GUALTERIANA Linn., 1767. Pl. 53, figs. 6–8.

Covered perforate, carinate, flattened above, convex below, solid, reddish or brownish white, dull, decussated with oblique and spiral coarse rough sculpture; spire flat or slightly elevated, the apical whorl smoother; whorls 4, rather rapidly widening, with an acute compressed carina; body-whorl very convex below, turgid at the center, more or less deeply deflexed anteriorly; aperture angulate-ovate, transverse, oblique, wider than long; peristome expanded, reflexed and appressed over the umbilicus. Diam. 40, alt. 17 mill.

Provinces Cadix, Almeria, Granada, Murcia, Spain.

H. obversa Born is synonymous.

Var. LAURENTII Bourguignat. Pl. 53, figs. 9–13.

Differs from the type in the smaller size, elevated spire, less distinct keel, less rude sculpture and smaller aperture.

Sierra Elvira, at Granada.

H. SULTANA Morelet, 1880. Pl. 63. figs. 40–42.

Covered perforate, rather thin, wide conoidal, depressed, microscopically granulate and obliquely sculptured, near the keel marked with a few spiral lines, dirty white, lusterless, spire obtuse, apex corneous; whorls 4½, exserted, nearly flat, the last turgid below, briefly and suddenly deflexed; aperture very oblique, subtrapezoidal, acutely angled; peristome thin, the margins approaching, the upper

straight, lower dilated, reflexed, more or less concealing the perforation. Diam. 28, alt. 13 mill.

Mts. of Tertuan, Morocco.

H. subscabriuscula Bourg., published before *sultana*, but with neither description or figure, is a synonym.

H. LEACHII Férussac, 1821. Pl. 63, figs. 26–28.

Nearly covered perforate, carinate, convex-lenticular, sculptured above and below with numerous pliciform costæ, which are parallel with the aperture, pale grayish yellow or whitish, opaque; whorls 4, scarcely convex, the last with a keel which becomes obtuse toward the aperture, very convex below, suddenly deflexed anteriorly; aperture very oblique, transversely subovate; peristome dilated, expanded, white, the upper and lower margins subequally curved, converging, joined by a distinct shining wide callus. (*v. Martens.*)

Diam. 17–19, alt. 10–12 mill.

Tarhuna Mts. Tripoli.

H. tripolitana Wood is synonymous.

H. SCABRIUSCULA Deshayes, 1830. Pl. 53, figs. 19–21, 14–16.

Covered perforate or nearly so, depressed, carinated, low-conic above, convex below, solid, whitish unicolored or with several spiral cordons of reddish blotches, more or less strongly obliquely striate, and covered with a microscopic granulation; whorls 4–4½, moderately increasing, flattened on the upper surface, with a compressed exserted median keel; body-whorl gibbous below, rather suddenly and deeply deflexed anteriorly; aperture oblique, transversely oval, acutely angled at the termination of the carina; peristome expanded, terminations sub-converging, the basal margin frequently subdentate, appressed over the umbilical perforation. Diam. 24, alt. 10 mill.

Western Sicily.

H. erycina Jan. is synonymous.

Var. SELINUNTINA Philippi. Pl. 62, figs. 28–30.

Differs from the type in the interrupted reddish bands; carina not exserted, striæ simple.

Var. SEGESTANA Philippi. Pl. 53, figs. 1–5, 17, 18.

Umbilicus generally slightly open; sculpture consisting of elevated anastomosing wrinkles; keel crenulated.

Var. PACINIANA Philippi. Pl. 55, figs. 36–38.

Rather thin, coarsely sculptured with white anastomosing wrinkles; columella concave, not callous; keel becoming obtuse or obsolete toward the aperture. Diam. 16 mill.

H. vieta Rossm. (pl. 62, figs. 32–34.) is synonymous.

There is a *forma major*, measuring 20 mill. diam. (pl. 55, fig. 34, 35). This form may be distinct from *scabriuscula*; the specimens before me have a more distinct aspect than the other varieties.

Var. EXPLANATA Benoit. Pl. 62, fig. 31.

Half-covered perforate; spire planate; whorls above subconcave, exserted at the carina, the last very turgid beneath.

Var. DEMISSA Benoit.

Small, subperforate, striate, spire subplane, whorls a trifle exserted at carina.

Var. DREPANENSIS Huet. Pl. 62, figs. 26, 27.

Small, elate-turrited, whorls scalariform, acutely keeled, sculpture of coarse white wrinkles on a livid ground.

Var. *scalariformis* Ben. is a synonym.

H. SARDONIA Martens, 1884. *Unfigured.*

Perforate, carinate, depressed, rugose-striate, whitish, maculate with brown above, with a single interrupted band below; spire slightly prominent; whorls 4, above flattened, with a more or less exserted carina, the last rather convex below, distinctly descending anteriorly; aperture very oblique, axe-shaped; peristome white, margins approximating, the upper expanded, the basal reflexed, concave, arcuate, partly covering the perforation. (*Martens.*)

Diam. 21, alt. 10½ mill.

Dorgali, Sardinia.

Very similar to the Sicilian *H. scabriuscula* Desh. and *H. segestana* Phil.; but the rib-striæ are finer and more regular, the columellar margin more strongly concave. In the intensity of the brown markings, which generally are above arranged into two interrupted bands, the covering of the umbilicus by the peristome (⅓–½), the exsertion of the keel of each succeeding whorl, and the absolute size, there is great variation among various specimens. (*Martens.*)

The above descriptions and comments, translated from v. Martens, contain all the information published regarding this species, which is, apparently, quite distinct.

Var. DORGALIENSIS Maltzan.

Differs from the type in the higher spire, thickened, decidedly reflexed peristome, its terminations joined by a distinct callus.

Diam. 20, alt. 10½ mill.

H. GROHMANNI Philippi, 1836. Pl. 54, figs. 7, 8.

Covered perforate, orbiculate-depressed, carinate, subtly striate, white, with three or four spiral series of brown blotches; whorls 4½, subplanulate, the last subdeflexed anteriorly; aperture lunar axe-shaped, dark banded within; peristome simple, the upper margin subexpanded, the basal appressed, subdilated and reddish at the columella. (*Pfeiffer*). Diam. 21 alt. 9½ mill.

Palermo, Sicily.

Benoit considers this a form of *H. serpentina*, a very probable supposition.

H. MURALIS Müller, 1773. Pl. 62, figs. 35–37.

Imperforate, depressed-globose, solid, opaque, whitish, with spiral bands of blotches or large patches and irregular strigations of dark brown, the base light; surface marked with coarse oblique, wavy irregular wrinkles, obsolete below, and a secondary microscopic sculpture of delicate undulating growth-lines, decussated by fine spiral impressed lines; spire low-conic, obtuse; whorls 4–4½, the inner rather flattened, apex smooth, the body-whorl wide, well-rounded, sometimes obtusely subangular at its origin, convex below, indented around the axis, anteriorly suddenly, rather deeply descending; aperture very oblique, dark within, oval-truncate; peristome white, expanded, margins subapproaching, the basal somewhat straightened within, appressed at the axis. Diam. 18, alt. 10 mill.

Sicily; Italy; southern France and Spain; Balearic Is.

The following are synonyms: *H. orgonensis* Philbert, (pl. 60, figs. 71–73.) *H. abromia* Bourg., *H. abraea* Bourg.

Var. RUGOSA Ziegl. Pl. 62, figs. 42, 43.

Very rudely sculptured above, the wrinkles white on a dark ground; body-whorl often more or less keeled at its origin.

Sicily.

Var. COSTULATA Benoit. Pl. 62, figs. 40, 41.

Depressed; sculptured with strong ribs; peripheral keel extending to the aperture. *Western Sicily.*

Var. CRISPATA Benoit. Pl. 60, figs. 68–70.

Strongly sculptured with radiating ribs, which extend to the axis below; periphery not keeled. *Marsala, Sicily.*

Var. ALUTACEA Paul. Pl. 62, figs. 44–48.

Shell smooth, leather-colored. *Calabria.*

Var. INSULARIS Benoit.

Depressed; below interruptedly unifasciate with rufous, above ornamented with series of zigzag radiating strigations; axis marked with a brown spot; radiating sculpture subobsolete.

Maretimo.

Var. UNDULATA Michaud. Pl. 62, figs. 38, 39.

Whitish, with radiating undulating or zigzag brown strigations above, and one or more cordons of square or arrow-shaped blotches below the periphery.

Provence; Italy; Sicily.

H. serpentina var. *communis* Benoit is synonymous.

H. TIBERIANA Benoit, 1859. Pl. 64, figs. 21, 22.

Covered perforate, pyramidal or slightly depressed, costulate-rugose, the costulæ becoming evanescent on the base, scarcely shining, rather solid, bluish white, sometimes a little maculate or interruptedly fasciate with brown; spire exserted, apex obtuse; whorls 5, subplanulate, carinate, the carina upon the spire lying in the suture; last whorl becoming rounded toward the aperture, profoundly and abruptly descending anteriorly; aperture oblique, ovate-lunate, peristome white, the margins converging, the upper expanded, the basal reflexed, base callous, sometimes subdentate, dilated at the insertion, appressed, covering the umbilicus, axis with a brown spot; fauces brown. Diam. 21, alt. 12–13 mill.

Scupedda, near Calatafimini, north coast of Sicily.

Separated from its allies by the straight, conical spire; the surface generally exhibits the same microscopic granulation that is found in *H. scabriuscula*, *muralis*, etc.

H. GLOBULARIS Ziegler, 1838. Pl. 38, figs. 82, 83.

Imperforate, depressed-conic-globose, solid, finely striate; whorls 4½, slightly convex, the last rounded, descending anteriorly; aperture oblique, oval-lunar; peristome expanded, the margins converging, the basal margin callous, flattened, appressed for half its length

to the turgid base, brown spotted and covering the umbilicus at its insertion. Diam. 14–19, alt. 9–13 mill. *Sicily*; *Tarento*.

H. frivaldskyi Calcara is synonymous.

"*Helix globularis* forms a natural transition between *muralis* and *platychela*; it is generally more elevated and globular than the *muralis*, and has the peristome more expanded, whilst in the *platychela* it is reflexed. The main difference from *muralis* lies in the aperture, of which the basal margin appears more extended, callous, provided with a fold or even a tooth,—which is very rarely the case with *muralis*." (*Kobelt.*)

The species is variable in form, size and color, and sometimes very difficult to separate from *H. muralis*.

Var. CONSPICUA Benoit. Pl. 38, figs. 84, 85.

Large, globose, marked with four maculose interrupted bands. *Palermo*.

Var. COSSURENSIS Benoit.

Small, spire less elevated, ornamented with close wide maculations. *Pantellaria*.

Var. UNDULATA Kobelt. Pl. 62, figs. 49, 50. *Palermo*.

Var. ACHATINA Benoit.

Whitish, without bands or maculations. *Palermo*.

Var. TARENTINA Kobelt. Pl. 62, figs. 51, 52.

Whorls more planulate than in the type, and base of the aperture not dentate. *Tarento*.

H. MELITENSIS Férussac. Pl. 54, figs. 24–26.

Imperforate, depressed-globose, more or less conoidal, solid, whitish, or obscurely strigate or subfasciate with light brown, marked with rather irregular oblique growth-lines and microscopic rather distant spiral engraved lines, which are frequently subobsolete, and usually wanting on the base; spire more or less depressed-conic, apex obtuse; whorls 4–4½, slightly convex, the upper ones obtusely subangulate, the body-whorl convex, abruptly and deeply deflexed anteriorly; aperture truncate-oval, very oblique, rather small, dark-colored within; peristome expanded, white, the upper and lower margins subparallel, not converging, the basal callous and substraightened, sometimes subdentate within, with a brown spot at its insertion. Diam. 19–21, alt. 12–15 mill.

Malta.

This form is allied to *H. globularis*, and especially to *H. platychela*, but may be separated by several characters from both of these Sicilian species. The peristome is not so broadly expanded as in *platychela*, nor is it so decidedly dentate as is usual in that species; and there is not so obvious a flattening of the upper whorls as in the more depressed forms (which are nearest to *melitensis*) of *platychela*.

Var. CARUANÆ Pilsbry. Pl. 62, fig. 54–56.

Spire elevated, conoidal; aperture small and very oblique; coloration usually of zigzag brown strigations sometimes broken into obscure bands above, and a narrow cordon of blotches below the periphery.

Malta.

H. PROVINCIALIS Benoit, 1842. Pl. 64, fig. 19, 20; pl. 60, figs. 74, 75.

Imperforate, depressed, slightly shining, solid, white, unicolored or marked with four cordons of pale brown spots, irregularly obliquely striate, and with microscopic spiral incised lines above, less striate below; spire low conoid, blunt, but the apical whorl slightly projecting, corneous; whorls 4½–5, the upper ones somewhat flattened, the body-whorl depressed, (more so than in either the several preceding or following species) sub-angulate at its origin, abruptly and deeply descending at the aperture, generally a little indented around the axis below; aperture small, very oblique, truncate-oval, slightly darkened and often fasciate within; peristome expanded, outer and basal margins reflected, terminations not converging, baso-columellar portion appressed, callous and straightened within, but not at all dentate. Diam. 17–19, alt. 12–14 mill.

Sicily.

H. saracena Benoit mss. is the same.

The small oblique aperture, not dentate below (not even so much as is shown in figs. 74, 75 of pl. 60) but callous, and the depressed body-whorl will enable one to distinguish this species. There is usually a faint brown spot at the insertion of the columella.

H. RAGUSÆ Kobelt, 1884. Pl. 68, fig. 17–19.

Imperforate, depressed trochoidal, the base inflated, solid, slightly shining, irregularly striate, under the lens showing spiral impressed lines, grayish white, with obscure traces of bands of maculations; whorls 5, the first 1½ smooth, convex, the apex a little exserted, submamillate, the following planulate, distinctly carinate in young

specimens, slowly increasing, with moderately impressed suture; body-whorl subinflated, angulated at the periphery, the angle becoming evanescent toward the aperture, base subgibbously inflated, anteriorly deeply descending; aperture oblique, transverse lunate-oval; peristome white, thickened, broadly expanded all around, and reflexd, ethe margins subconverging, not connected, the basal margin callous, distinctly plicate-dentate, with a brown spot at the insertion of the columella. (*Kobelt.*) Diam. 22½, alt. 14 mill.

Western Sicily.

Allied to *H. provincialis*, but with much more broadly reflected peristome than that species.

H. PLATYCHELA Menke, 1830. Pl. 54, figs. 1–6.

Imperforate, globose, or somewhat depressed, solid, whitish, sometimes unicolored, usually with four rather narrow bands composed of (generally faint) brown spots, rarely subcontinuous; lightly, rather irregularly obliquely marked with growth-lines, and with spiral microscopic incised lines; spire pyramidal, the apex obtuse; whorls 5–5½, slightly convex, slowly increasing, the sutures moderately impressed; body-whorl subglobose or somewhat depressed, generally well rounded, deeply deflexed anteriorly, convex below; aperture rounded oval, very oblique, slightly darkened and usually showing bands within; peristome broadly expanded, outer margin reflected, basal margin reflexed, adnate to the body toward the axis, broad, flattened, with a truncated lamella or tooth within.

Diam. 24–26, alt. 16–23.

Sicily.

H. prætexta Jan is a synonym.

An exceedingly variable form, easily distinguished typically by the broad peristome and elevated form. There are however depressed varieties which approach *globularis*, etc. A small form measures diam. 15, alt. 12 mill.

Var. ROSALIÆ Benoit. Pl. 62, fig. 53.

Usually larger than the type, whorls of the spire planulate, carinate, the last rounded; base more convex; peristome less broadly expanded and reflexed. Diam. 26, alt. 19 mill.

Palermo.

Var. IPARIA Benoit. Pl. 64, figs. 23, 24.

Depressed; whorls of the spire planulate; body-whorl more or less keeled.

Palermo.

H. ASCHERÆ Kobelt, 1880. Pl. 62, figs. 57–60.

Subdepressed-turbinate, rather thin, striatulate, imperforate, whitish, rarely unicolored, or with four girdles of small rufous-brown spots; whorls 5½, regularly increasing, the upper ones slightly convex, penultimate and last whorl convex, with impressed suture; body-whorl subdilated, inflated below toward the aperture, anteriorly strongly and abruptly deflexed, and sub-constricted behind the aperture; aperture very oblique, lunate-rotund; peristome reflexed, strongly albolabiate; fauces brownish, showing the bands; margins converging, the basal arcuate, sometimes callous, dilated and wholly covering the umbilicus, brown-spotted at the insertion. (*Kobelt.*)

Diam. 22½, alt. 16 mill.

Trapani, Sicily.

"The upper whorls are quite flat, like those of *platychela;* and it would appear as though young examples were keeled; the suture is not at all impressed. The penultimate whorl first begins to be more convex, and the suture deeper; the last whorl is somewhat widened, rounded at the periphery, the base tumid as it approaches the mouth, very deeply deflexed, and somewhat constricted." (*Kobelt.*)

Very closely allied to some forms of *H. platychela.*

H. RIDENS Martens, 1884. *Unfigured.*

Covered perforate, subglobose-depressed, white, marked with four dark brown bands, the upper interrupted, striatulate below the suture, shining, whorls 4½. the first convex, grayish-brown, unicolored, the following subangulate, body-whorl rounded, convex below, deeply descending anteriorly; aperture very oblique, wide-ovate; peristome white, rather broadly reflexed, the margins approximating, arcuate above and below, the columellar margin dilated and appressed. Diam. 17, alt. 11 mill.; aperture, diam. and alt. 9 mill. (*Martens.*)

Dorgali, Sardinia.

"Some specimens exhibit a small umbilical fissure, but in the greater number this is closed by the expansion of the columellar margin. A very minute spiral striation is visible upon the upper surface of most specimens, with a lens of moderate power."

"This species is comparable to the Sicilian *H. globularis* Ziegl., and the more flattened forms of *H. platychela* Mke. By the broader aperture, more strongly concave columellar lip, without trace of a tooth, it may be distinguished from these." (*Martens.*)

The following variations are described:

Var. SPLENDENS Maltzan.

Differs from the type in the distinctly conoidal shell, last whorl subcompressed, trifasciate, aperture narrower.

Diam. 17, alt. 11 mill. *Dorgali, Sardinia.*

Var. MINOR Maltzan.

Shell much smaller. Diam. 14½, alt. 9½ mill.

Dorgali, Sardinia.

H. PLATYCHELOIDES Kobelt, 1881. Pl. 54, figs. 9–12.

Covered umbilicate, conoid, spire exserted, striatulate, scarcely shining, solid, white or encircled by five castaneous bands; whorls 5, somewhat convex, separated by linear, distinct sutures, regularly increasing, the last inflated, anteriorly abruptly deeply deflexed; aperture very oblique, irregularly ovate, slightly lunate; peristome labiate with white, the margins considerably converging and joined by a distinct callus, upper margin expanded, outer and basal reflexed, basal margin wide, distinctly expanded above the umbilicus, armed with a straightened callus or subdentiform fold within.

Diam. 24, alt. 17 mill.

Mts. of Beni Hosemar, Morocco.

This species sustains the same relation to *H. sicanoides* that the Sicilian *platychela* bears to *sicana*. It differs from *platychela* (to which many examples are very similar in outline) in the constant presence of an umbilicus, the less reflected peristome and the peculiar apex. (*Kobelt.*)

H. BOETTGERI Kobelt, 1881. Pl. 54, figs. 27–29.

Covered rimate, depressed conoid, solid, striatulate, microscopically granulate, but not so distinctly spirally striate as *H. tetuanensis*, whitish, or yellowish-green, variously painted with bands and flammules of brownish; whorls 5, the first two forming a projecting apex, the following less convex, the last somewhat inflated, deeply deflexed anteriorly; suture linear, impressed; aperture very oblique, transverse-oval, the peristome acute, thin, strongly labiate with white, the margins converging, and joined by a thin callus, the upper expanded, outer slightly and basal distinctly reflexed over the rimate umbilicus, bearing inside a straight or dentiform callus.

Diam. 20–21, alt. 13½ mill.

Mts. Beni Hosemar, near Tetuan, Morocco.

This form, which inhabits the more western mountains, is in general shape scarcely to be distinguished from many forms of the Sicilian *H. globularis*, but may be readily recognized by the sculpture and the columellar lip, which is not appressed. To the *H. tetuanensis* it holds about the same relation as *globularis* to *platychela*. (*Kobelt.*)

H. GYROSTOMA Férussac, 1821. Pl. 54, figs. 20, 21.

Covered perforate, globose, lightly obliquely striatulate, whitish-gray (bleached?) with numerous small opaque white flecks, and larger, more translucent grayish markings; this gray is above formed into flammules somewhat, and below into two narrow bands; and upon these translucent tracts the white flecks are principally distributed; whorls 4½, the first relatively large, the second and third flatter, appearing decidedly carinated in the suture, the last inflated, well rounded, very strongly deflexed anteriorly; aperture very oblique, comparatively small, circular, the terminations of the peristome joined by a thick shining white callus, its margins briefly expanded, white. (*Martens.*) Diam. 19½, alt. 12½ mill.

Tripoli.

In the early part of the century this Helix was found in Tripoli, and communicated by Dr. Leach to Férussac; and again in 1879 a single example was taken by Dr. Erwin von Barry, in the first range of the Tarhuna Mountains.

Pl. 50, figs. 55, 56 are copied from the original figures of Férussac.

H. SCHERZERI Zelebor, 1868. Pl. 60, figs. 86–88.

Imperforate, globose-depressed, rather thin, striatulate, whitish, with sparsely scattered corneous points or also with five continuous brown bands; spire slightly elevated, apex obtuse; whorls 4½, slightly convex, the last inflated, anteriorly profoundly deflexed; aperture very oblique, subcircular, peristome albolabiate, the margins approximating, joined by a callus, briefly reflexed, the columellar obsoletely unidentate within, dilated and appressed above the axial region. (*Pfeiffer.*) Diam. 20, alt. 11 mill.

Gibraltar.

This species is distinguished from the preceding and the following species, to which it stands nearest, by the entirely closed umbilicus. The columellar reflection is however perfectly sharply defined, and distinctly visible. From the *H. marmorata*, with which it lives, it may be separated always by the white lip. (*Kobelt.*)

H. TETUANENSIS Kobelt, 1881. Pl. 54, figs. 30–33.

Covered perforate, globose conoidal, beautifully undulately granulate under the lens by the decussation of distinct incremental striæ and very fine spiral impressed lines; rather thin, lustreless, unicolored dirty yellow or with brown bands, sometimes coalescent; whorls 5, well rounded, separated by impressed sutures, the first forming a projecting apex, the last inflated and briefly, deeply deflexed anteriorly; aperture very oblique, lunate-rounded; peristome acute, labiate with white, the margins converging, and joined by a callus, upper margin a little expanded, outer and basal margins reflexed, columellar lip expanded over the perforation, and bearing a strong dentiform fold inside. Diam. 20, alt. 17½ mill.

Mts. Beni Hosemar, at Tetuan, Morocco.

Closely allied to *H. böttgeri.*

H. SICANOIDES Kobelt, 1881. Pl. 54, figs. 17–19.

Very slightly but always sensibly rimate, globose-subconoid, apex exserted, rather thin but solid, unicolored whitish or yellowish, or with brown or blackish bands of various widths, striatulate; whorls 5, separated by distinct linear suture, the upper ones flattened, the following more convex; body-whorl inflated, abruptly descending at aperture; aperture very oblique, rotund-lunar; peristome labiate with white, slightly reflexed on the base, margins converging, joined by a light callus; columella with a strong callus, sometimes dentiform below. Diam. 21, alt. 16½ mill. (*Kobelt.*)

Mts. Beni Hosemar, near Tetuan, Morocco.

Very nearly allied to the Sicilian *H. sicana*, says Kobelt, but constantly separated from that species, after an examination of several hundred examples of each, by the umbilical rimation, of which *sicana* never has any indication, by the peculiar apex, and the less reflected peristome.

H. SICANA Férussac. Pl. 54, figs. 13–16.

Imperforate, globular or bullet-shaped, thin but rather solid, whitish, unicolored or with three or four narrow brown or corneous subcontinuous bands, delicately opaquely striate, the surface decussated by numerous fine incised spiral lines, base nearly smooth; spire more or less elevated conic, obtuse; suture linear, but well impressed and distinct; whorls 5–5½, those of the spire somewhat flattened, gradually increasing; body-whorl globose, rounded, very convex below, somewhat constricted behind the aperture, rather deeply deflexed anteriorly; aperture small, rotund-lunar, very ob-

lique; peristome white, narrowly reflexed, its margins converging, the columellar with a short callus plate inside. frequently truncate or subdentate at base. Diam. 21, alt. 18–21 mill.

Near Palermo, Sicily.

H. soluta (Ziegl.) Phil. is a synonym.

Although quite variable, this species need be confounded with no other Sicilian shell. The imperforate base, strong spiral sculpture, small aperture and narrow peristome, as well as the globular form will distinguish it.

* * *

B. The following group of *Iberus* contains shells with rounded periphery, generally rather smooth surface, and depressed form, the base usually indented at the center or perforate. They are characteristic of peninsular Italy and the Continent, rather than of Sicily.

H. NICIENSIS Férussac. Pl. 64, figs. 14–18.

Covered perforate, depressed, slightly shining, thin but rather solid, whitish, encircled by four or five spiral series of brown or corneous spots, sometimes coalescent into irregular blotches above; surface striatulate, and with sparse interrupted spiral lines above; spire low conic, obtuse; whorls 5, the first forming a slightly salient apex, the following a little flattened, the last rapidly widening, depressed, rounded at periphery, slightly indented in the center of the base, rather deeply deflexed anteriorly; aperture rounded-lunate, oblique, lilac colored within; peristome labiate with the same color, slightly expanded, the margins subapproaching; basal margin flattened, with a callus lamina within. Diam. 22, alt. 13 mill.

Central France; Italy.

H. nicæensis of Risso and of Rossmæssler is the same.

H. SERPENTINA Férussac. Pl. 60, figs. 59–65.

Covered perforate, depressed, rather solid, opaque, somewhat shining, lightly obliquely striatulate, whitish or yellow tinged, painted in innumerable patterns with deep chestnut, the markings generally more or less formed into narrow spiral interrupted zones, of which three (one subsutural, indistinct) are above, two (the outer more distinct) below the periphery; or radiately maculate and strigate above, sometimes with the whole ground-color deep chestnut, upon which are zigzag white vermiculations and strigations; spire depressed conoid, the apex subplanulate, corneous; whorls 4½–5, the inner gradually, the outer rapidly widening; body-whorl depressed,

rounded at periphery, subflattened below, and indented in the center, anteriorly slightly deflexed; aperture broadly semioval, oblique, whitish within, not showing the bands prominently; peristome narrowly expanded, slightly albolabiate, its upper and lower margins subparallel, not converging; columellar margin reflexed, appressed over the axis, dark colored, especially toward the umbilical callus; parietal wall chestnut colored. Diam. 18, alt. 10 mill.

Southern France; Italy; Corsica; Sardinia.

An excessively mutable form, which has been divided by authors into numerous species and varieties, the chief objection to which is the extreme difficulty of distinguishing them, even with the aid of good figures.

The Marchesa Paulucci has made a critical study of the group (Bull. Soc. Mal. Ital., viii) and, except in considering *hospitans*, *carœ*, etc., *subspecies* instead of *species*, I have not departed from her arrangement of the forms.

Var. ISILENSIS (Villa) Mabille. Pl. 63, figs. 29–31.

A pallid depressed form which is considered by the Marchesa Paulucci to be a variety or local race of the *H. serpentina*, the principal character of which is the total want of color. There are also individuals with dark dots or spots. Diam. 20–21, alt. 10–11 mill.

Sardinia; Corsica.

Var. JASPIDEA Moq.-Tand. Pl. 61, figs. 20–22.

Larger, bands not distinct above, marbled; colors bright.

Bonafacio, Corsica.

Var. ISARÆ Paulucci. Pl. 61, figs. 23–25.

Shell more rugose than the type, the interrupted zones paler; no umbilical or parietal macula; columellar margin brown-punctate. Diam. 20, alt. 12 mill. *Sardinia.*

Subspecies HOSPITANS Bonelli. Pl. 54, figs. 22, 23.

A form differing in its rather larger more globose form from the typical *serpentina*. "The coloration varies from a whitish ground, all covered with dots of dark or pale brown disposed in series like interrupted zones, to a milk-white, without trace of markings. The spot which ornaments the base at the insertion of the columella, however, always remains constant, but even this is subject to great mutation as well in the intensity of its color as in the size. As for the form, the modifications are still more obvious; for, whilst the

type is rather globulose, the last whorl comparatively inflated, there occur with it forms almost angulate, and others actually carinated." (*Mme. Paulucci.*)

Sardinia.

The synonymy includes, according to Mme. Paulucci, *H. magnettii* Cantraine (*non magnettii* Mabille) and *H. carœ* Kobelt (*non carœ* Cantraine).

The following form is described by the Marchesa Paulucci as a variety of *H. hospitans*, which is considered by her a species distinct from *H. serpentina*, although connected with the latter by transition forms.

Var. ALABASTRINA Paulucci. Pl. 61, figs. 17–19.

"Differs from the type by the more globose, more solid shell; the last whorl less dilated; the brown umbilical and parietal maculation wanting; columellar margin thick, alabastrine; aperture small."

Diam. 20, alt. 14 mill.

Another form inhabiting *Cape St. Elias*, has been called by Mme Paulucci mutation (or variety) *porphydica*. Its differential characters are found in the entire absence or great reduction of the spot at the insertion of the columella, and the coloration of the surface, which consists of small crowded maculations, which frequently have a tendency toward violaceous, instead of brown.

Subspecies CARÆ Cantraine. Pl. 64, figs. 9, 10.

Imperforate, orbiculate-convex, somewhat depressed, smooth, shining, yellowish marbled and vermiculate with dirty white, ornamented with five brown interrupted zones; spire prominent but subplane; aperture ovate-lunate, white, as wide as high; peristome reflexed; umbilical callosity bordered yellowish. *Corsica; Sardinia.*

H. halmyris Mabille is synonymous.

Var. ADJACIENSIS Paulucci. Pl. 64, figs. 11–13.

Smaller, more globose, spire elevated, umbilical tract with a brown spot, columellar and parietal margins brown.

Diam. 21, alt. 15½ mill.

Subspecies CENESTINENSIS Crosse et Debeaux. Pl. 60, figs. 94, 95.

Imperforate, turbinate-depressed, somewhat solid, slightly shining, scarcely striate, whitish, encircled by spiral rather wide regular deep chestnut zones, variegated with white; spire subdepressed, apex obtuse, smooth, pale violet; suture impressed; whorls 4½,

slightly convex, the last slightly descending, below bifasciate; aperture oblique, wide lunar, livid whitish within; peristome labiate, the margins distant, nearly sub-parallel, the columella (and umbilical tract) deep brown, subdilated basal and outer margins whitish. (*Crosse et Debeaux.*) Diam. 19, alt. 11 mill.

Corsica.

May be distinguished from its allies by the regular disposition, width and deep color of the bands.

Var. SUBURBANA Paulucci.

More convex, conic and solid, and more striate; the last whorl less globose; aperture broader and shortened.

Diam. 19½, alt. 13 mill. *Sassari, Sardinia.*

H. OBERNDOERFERI Kobelt, 1882. Pl. 60, figs. 96, 97.

Imperforate, depressed-conic, rather solid, densely sub-costate-striatulate, whitish gray, with five interrupted bands or series of maculations of chestnut, which are more distinct and continuous toward the aperture, and marked from the upper to the lowest band with clear corneous zigzags and flecks, as in *H. serpentina;* base whitish, unmarked, or at most with a few streaks; whorls 5, convex, the apex obtuse, regularly increasing, suture linear, moderately impressed; body-whorl scarcely dilated, subinflated, convex below, and impressed in the umbilical region, deeply deflexed anteriorly; aperture ovate-rotund, deeply lunate, the margins distant, the upper slightly expanded, outer a little reflexed, the basal thickened, subdentate, scarcely dilated. (*Kobelt.*) Diam. 20, alt. 14 mill,

Palma, in Mallorca, Balearic Is.

Lacks the spot at the insertion of the columella, which is so characteristic of *H. serpentina.*

H. PUDIOSA Paulucci, 1882. Pl. 63, figs. 32–34.

Imperforate, orbiculate, depressed convex, opaque, striatulate, slightly malleate, white, ornamented with five interrupted brown zones; spire subprominent, apex obtuse, smooth, corneous; whorls 4½, scarcely convex, (the first slowly, last rapidly increasing), separated by an impressed suture; the last subcompressed, convex below, anteriorly toward the aperture abruptly deflexed, not dilated; aperture oblique, ovate-oblong, whitish; peristome lightly labiate within, the margins converging, approximating. (*Paulucci.*)

Diam. 16, alt. 9½ mill.

Sassari, Sardinia.

H. VILLICA Paulucci, 1882. Pl. 63, figs. 51–53.

Somewhat umbilicated, orbiculate, depressed-convex, opaque, rugose-striate, whitish, ornamented with four interrupted zones, formed of brown maculations, spire subprominent, apex minute, mamillate, violaceous; whorls 4½–5, slightly convex, (the inner regularly, last rapidly increasing) separated by impressed sutures; the last whorl subcompressed, subinflated below, anteriorly at the aperture suddenly deflexed, not dilated; aperture oblique, subcircular, the margins approaching; peristome thin, reflexed; columellar margin dilated, partly closing the umbilical perforation. (*Paulucci.*)

Diam. 19, alt. 11 mill. *Sardinia.*

H. TETRAZONA Jan. Pl. 64, figs. 25–27.

Depressed, umbilicate, transversely striate, whitish, with four brown zones; aperture lunate-rotund; peristome subreflexed, submargined. (*Christ et Jan.*) Diam. 18, alt. 9 mill.

Abruzzi.

H. intermedia var. *β*, Pfr. is a synonym.

H. STRIGATA Müller, 1773. Pl. 66, figs. 92a, 92b.

Umbilicate, depressed, white, with four chestnut bands, the upper three interrupted, narrow; upper surface striate, whorls 4½, rather flattened, the last deflexed anteriorly; aperture rounded oval, oblique; peristome reflexed, sublabiate, white, the margins converging.

Diam. 19, alt. 8½ mill.

Central Italy.

Var. UMBRICA Charp. Pl. 64, figs. 30,31.

Moderately umbilicate; periphery subangulate; surface strongly costate.

Umbria.

Var. SURRENTINA (A. Schmidt) Martens. Pl. 65, figs. 50, 51

Shell almost covered perforate, subdepressed, very subtly striate, slightly pinkish white, with four pale chestnut interrupted bands; whorls 4½, slightly convex, the last descending, aperture very oblique, oval; peristome reflexed, patulous, sublabiate, pinkish brown, the margins approximating, the basal arcuate; with a brown umbilical spot. (*Martens.*) Diam. 16, alt. 7 mill.

Naples.

In part *H. carseolana* of authors. It is not according to Mme. Paulucci, the *surrentina* of Kobelt, (Icon. v, t. 123, f. 1172, 1173) which is var. *fuscolabiata* Rossm.

Var. FUSCOLABIATA Rossm. Pl. 64, figs. 32–34.

Somewhat larger than the type, sometimes bandless, usually with the lower band absent, the others so interrupted that the shell appears above to be radiately streaked with white and brown; aperture and peristome clear brown. *Sorrento; Capri; Pæstum.*

Var. POSIDONIENSIS Tiberi. Pl. 60, figs. 66, 67.

Large, decidedly widened, especially the last whorl; depressed and sharply sculptured. *Pæstum.*

Var. SICULA Benoit.

Sharply costulate above; aperture more rounded, fusco-labiate. *Sicily.*

Var. APULA Blanc. Pl. 64, figs. 28, 29.

Sculpture more distinct; aperture more rounded, less oblique. *Taranto.*

Var. POLITA Paulucci.

This pretty variety is distinguished by its relatively almost smooth shell, as well as by the row of little spots scattered along the suture, a character which is completely absent in all the typical individuals. I have received this variety from Engineer Molteni, of Foligno (Umbria), mingled with a number of *H. strigata*. It appears quite common. (*Paulucci.*)

H. CARSOLIANA Férussac. Pl. 65, figs. 42–44.

Almost closed perforate, globose sub-depressed, thick, opaque white, with three narrow interrupted chestnut bands, spire slightly prominent, composed of 5 whorls, flattened and narrow, the last wide, very convex, with a very narrow umbilical perforation; surface irregularly striate, the striæ more prominent at the suture, becoming obsolescent below; aperture small, very oblique, oval, a little wider than high; peristome thickened within, narrowly reflexed, columellar margin oblique, dilated at the insertion. (*Fér. et Desh.*)

Diam. 18½, alt. 8½ mill.

It is *H. carseolana* Auct. and *H. marrucina* Tib., (pl. 66, figs. 84–86.)

Central Italy.

Mme. Paulucci (*Materiaux*, etc., p. 34) says: "The type of this species, as it is represented in the work of Férussac corresponds exactly with Mt. Maiella specimens which I have received from Dr. Tiberi under the name of *H. marrucina* (Pl. 66, figs. 84–86). It is a shell with the umbilicus wholly closed, with pale bands, so interrupted as

to be reduced to elongated points, widely separated from one another A variety usually smaller, more depressed, and consequently with wider aperture, and having a faint brown spot at the insertion o the columella, has been described by Dr. Westerlund under the name of *H. recondita.* I have had the types of the species from Mr. Westerlund; they are identical with mine. It seems to me impossible . . . . . to separate *H. recondita* specifically.'

"A second variety, more like the type in general form, and approaching *H. recondita* in the columellar spot, has been named by me var. CONTAMINATA . . . . . this variety frequently has the umbilicus partly open; the coloration is like that of the type but with the maculations or points more intense. It has below a more or less interrupted chestnut band."

"The third variety, which I have called UZIELLIANA (pl. 60, figs 76–80) is relatively very depressed, the columellar margin dark, the umbilicus decidedly open. It is the form which authors have looked upon as the type of the species, and called *H. carseolana.*"

Var. PERSIANII Tiberi. Pl. 65, figs. 39–41.

Large, umbilicate, spire flatter, columellar margin rufous-maculate Diam. 25, alt. 12 mill.

Var. UNIARMATA Paulucci. Pl. 65, figs. 35, 36.

Differs from the typical *carsoliana* of Férussac by the somewhat larger shell, somewhat compressed below, the umbilicus nearly closed; aperture widened, the margins subparallel, the lower strongly callous or dentate, with a brown spot at its insertion.

Diam. 21, alt. 13 mill.

Var. MILETTIANA Paulucci. Pl. 65, figs. 37, 38.

Differs from the type in the much larger conic shell, the last whor wider, much inflated; columella callous, widely brown-maculate peristome brown. Diam. 22, alt. 15 mill.

Mt. Miletto

H. NEBRODENSIS Pirajno. Pl. 60, figs. 83–85, 89–91.

Covered perforate or umbilicate, depressed-globose solid, opaque shining, white, encircled by two to four, usually three deep chestnut bands, the lower two subcontinuous, sometimes unicolored white, very lightly irregularly obliquely striate and with numerous microscopic spiral impressed lines, especially obvious near the aperture, spire low depressed conic, apex corneous, blunt, the first whorl convex, the following lightly convex, but with a flattened appearance; whorls

4½–5, the last rather wide, convex, its last third rather inflated below, abruptly deflexed anteriorly; aperture oval, wide, oblique, yellowish flesh-color within, showing the bands; peristome expanded, white, thickened somewhat within, the upper and lower margins subparallel, somewhat converging, the upper straightened, the basal margin rather straight, more or less thickened, sometimes even subdentate within, and appressed to the base for a short distance, the expanded columellar margin partially covering the umbilicus, at its insertion slightly brown-tinged.

Diam. 25, alt. 18 mill; diam. 26, alt. 16 mill.

Madonian Mts. Northern Sicily.

A *forma minor* (pl. 60, figs. 89–91) measures: diam. 20, alt. 13 mill.

A more flattened form from Castelbuono is figured by Kobelt (pl. 65, figs. 52–56.)

The spiral sculpture will separate this form from the preceding peninsular species.

H. EUGENIA Pfeiffer, 1853. Pl. 65, figs. 48, 49.

Partly or wholly covered perforate, subdepressed globose-conic, opaque, solid, cretaceous, shining, white, with fine incremental striæ and microscopic decussating spiral lines, sometimes subobsolete; spire depressed conic, apex corneous, prominent, but blunt; suture lightly impressed, linear; whorls 4½, the apical convex, the following flattened, moderately increasing; body-whorl subangular at the periphery, suddenly deflexed above; aperture rounded oval, very oblique, yellowish flesh-color inside; peristome obtuse, its ends converging, the baso-columellar margin reflexed and appressed, thickened within, expanded over or partly over the umbilicus, and with a brown spot at its union with the parietal wall. Diam. 14, alt. 9 mill.

Ficuzza, near Palermo, Sicily.

H. vigenia Parr. (in sched.) and *H. calypso* Benoit are identical.

First discovered by Benoit, but the name of Pfeiffer has priority.

Var. HUETIANA Benoit. Pl. 65, figs. 45–47.

Double the size of *H. eugenia*, more depressed, and usually slightly malleate; aperture dark within; carina often obsolete on last whorl. Diam. 21, alt. 12 mill.

Monte St. Giuliano.

H. hueti Pfr. is synonymous.

H. MARIANNÆ Kobelt, 1880. Pl. 60, figs. 92, 93; pl. 65, figs. 57, 58.

Of this species, which was at first identified with the long-lost *H. circumornata* of Férussac. Dr. Kobelt says: My examples show three bands of square reddish brown markings, which have their longer dimension in the direction of the incremental striæ; the middle ones are much wider than the two outer, and often formed by the coalescence of the second and third. The arrangement of the markings is remarkably regular, as the figure of Férussac indicates. The sculpture is like that of *H. carseolana* and also the form of the whorls, except that these are more raised, and no angulation is visible. The aperture more widely rounded, and relatively shorter than in the typical *carseolana;* the terminations of the peristome are much less approaching, and the basal margin is less thickened by the callus. The peristome, too, is of a rather bright reddish-brown color, and only its very edge is white. (*Icon. l. u. süss. w. Moll. Eur., etc., v., p.* 77.)

Separated from *H. surrentina* by the greater elevation, and the inflated whorls, which are shouldered at the suture; from *H. carseolana* by the closed umbilicus and the brown peristome. Its home is eastward from the Appennines, in that Apulian outlier of the Appennines known as the Murgie. (*Kobelt in Icon. etc., vii, p.* 9.)

This is the *H. circumornata* of Kobelt, (1877), not of Férussac.

Var. PEUCETANA Kobelt. Pl. 65, figs. 59, 60.

Nearly unicolored yellowish-brown above, the whitish ground-color of the type wholly lost; markings wholly coalescent, except for a dark subsutural zone and the second and third bands visible behind the aperture; fourth band sharply defined.

H. CIRCUMORNATA Férussac. Pl. 60, figs. 81, 82.

Imperforate, globose-depressed, glabrous, white, encircled by a single central fascia, and three series of orange-brown spots; whorls four, planulate, the last inflated; aperture lunate-elliptical, brown within; peristome subreflexed. (*Fér. et Desh., Hist., i, p.* 122.)

Diam. 17, alt. 9 mill.

The original figures of Férussac are copied on my plate. The species has not been satisfactorily identified with any of the Italian *Iberus*. Dr. von Martens has described and figured specimens of an *Iberus* similar to *H. mariannæ* as this species; but the correctness of his identification is extremely doubtful. See *Conch. Mittheil.*, i, p. 19.

H. SIGNATA Férussac. Pl. 65, figs. 61–65.

Covered perforate, subdepressed globose, white, ornamented with (usually) three interrupted chestnut bands; substriate; whorls 5, a little flattened, the last descending; aperture very oblique, lunate-rotund; peristome patulous, brown, albolabiate, the margins subconverging, the columellar callous, with a brown spot at its insertion. Diam. 22, alt. 13 mill. (*Pfeiffer.*)

Monte Cassino.

H. ficuum Mühlf. (and *H. circumornata* Mart.?) are synonyms.

H. ARGENTAROLÆ Paulucci, 1886. Pl. 67, figs. 4–6.

Perforate or partly covered perforate, rather thin, subtranslucent, densely striate and malleate, whitish flesh-color, ornamented with a wide, (sometimes interrupted) brown band below, and three zones of varying intensity and width, composed of flecks of the same color above; globosely depressed, spire convex, slightly elevated, apex minute, acute; whorls 5, the inner regularly, last rapidly increasing, separated by impressed sutures; body-whorl wide, rotund, inflated below, abruptly greatly deflexed and descending anteriorly; aperture wide, ovate; peristome thin, briefly reflexed, the columellar margin expanded, partly covering the umbilicus, brown-maculate. Diam. 25½, alt. 15 mill. (*Paulucci.*)

Promontory of Argentaro, Italy.

A very distinct species.

H. FORSYTHI Paulucci, 1886. Pl. 65, figs. 66–68.

Subcovered perforate, conico-depressed, solid, opaque, regularly densely striate bluish white, with three to four interrupted chestnut bands; apex acute, smooth; whorls 5, declivous, slowly increasing, the last large, inflated below, deflexed at the aperture; aperture oblique, subcircular, pale chestnut within, the margins approximating, the basal arcuate, brown-maculate at the insertion, the peristome somewhat reflexed. Diam. 18, alt. 11 mill. (*Paulucci.*)

Promontory of Argentaro.

H. forsythi is somewhat intermediate between *surrentina* and *strigata* var. *fuscolabiata*. From *surrentina* the bluish-white color, less rounded, more sloping form, the body-whorl more swollen below, rougher sculpture, different color pattern, and especially the more circular aperture distinguish it. From *fuscolabiate*, it is separated by the more sloping form, narrower last whorl, rounder, more oblique aperture and notably diverse sculpture.

Var. ORTA Paulucci, Pl. 65, figs. 69, 70.

Larger, conic-globose; whorls 5, rather convex, the last especially inflated. Diam. 21, alt. 14 mill.

H. SAXETANA Paulucci, 1886. Pl 66, figs. 75–77.

Subcovered perforate, subglobose-depressed, solid, shining, coarsely and irregularly striate, flesh-colored, with four interrupted chestnut bands; apex minute, corneous, smooth; whorls 5⅓, slightly convex, the inner regularly, the last rapidly widening, much inflated below strongly descending anteriorly, separated by impressed sutures; aperture nearly circular; peristome reflexed, pinkish brown sublabiate, margins approximating, the upper straight, the lower deeply arcuate, with a chestnut umbilical spot. Diam. 20, alt. 13 mill.

Promontory of Argentaro, Italy.

A small form, diam. 15, alt. 9, and a smaller, diam. 12, alt. 8 mill., are also noted by Mme. Paulucci.

This species is most nearly allied to *H. mariannæ*. It has one-half of a whorl less than the latter species, is more depressed, the last whorl is smaller and more inflated below, the mouth more circular, and the superior margin of the peristome is straight. From *H. carsoliana*, var. *milettiana* which is also allied, the number of whorls (lesser by one), the less elevated form, flatter whorls, larger, rounder aperture etc., will separate *saxetana*.

Unfigured and unidentified species of Iberus.

H. THERESÆ ("Benoit") Martens, 1861.

Narrowly umbilicate, depressed, obliquely rugose, whitish, with four interrupted yellowish brown bands; whorls 4½; slightly convex, the last descending; aperture very oblique, ovate-rotund; peristome patulo-reflexed, sublabiate, the margins moderately converging, columellar arcuate; no umbilical spot. (*von Martens.*)

Diam. 18, alt. 8 mill.

Sicily.

May be a synonym of *H. strigata*. There is an *H. teresæ* Benoit, 1845, but it is the same as *H. flavida* Ziegl. It is not unlikely that some confusion of specimens caused von Martens to describe the above *Iberus* as "*H. theresæ* Benoit."

H. UMBRICA (Charpentier) Mabille, 1868.

Moderately umbilicated, orbiculate-depressed, above convex-mamillate, whitish lutescent, a little shining, opaque, solid, ornamented with lamelliform costæ; spire subdepressed-subconvex, apex

obtuse, yellowish corneous, smooth; whorls 4–5, the first regularly, last rapidly increasing, subconvex-depressed, separated by moderately impressed sutures; body-whorl large, depressed, obscurely carinated at the periphery, gently descending and suddenly deflexed; aperture oblique, lunate, ovate, the margins approximating; peristome somewhat acute, a little expanded, white, sublabiate within, reflexed at the umbilicus, the columellar margin appressed, slightly thickened. Diam. 17, alt. 8 mill. (*Mabille.*)

Monte di Somma, Umbria.

May be a synonym of *H. strigata* Fér.

H. TIBERII (Parr.) Martens, 1860.

Covered perforate, conic-depressed, obliquely rugose-striate, decussated by microscopic spiral striæ, bands four, interrupted, the upper three confluent, marbled; aperture very oblique, transversely oval, brown within; peristome white, sublabiate, superior margin straight, columellar margin straightened, callus, subdentate, appressed. Diam. 21, alt. 10 mill. (*Martens.*)

Sicily.

I can learn nothing of the species.

H. BUELOWI Maltzan, 1886.

Entirely covered, or very slightly rimate, depressed, nearly lenticular, acutely carinated, solid, irregularly rugose, under a lens showing very subtle spiral lines, grayish white, quadrifasciate with brown maculations; whorls 5, the apical slightly convex, smooth, the following planulate, with a margined carina at the suture; body-whorl convex above and below, with a submedian prominently compressed carina, anteriorly abruptly, deeply deflexed; aperture very oblique, angulate-ovate, somewhat lunate, the margins converging, but scarcely connected, the upper at first subinflexed, then patulous, the lower reflexed, with a white shining callus, distinctly tuberculate in the middle within, a brown spot at its insertion.

Diam. 22½, alt. 12 mill. (*Maltzan.*)

Cape San Vito, Sicily.

Differs from *H. scabriuscula* in the median carina, and the reflexed, strongly dentate basal margin.

H. ROLLEI Maltzan, 1886.

Depressed, rather solid, rather smooth, under a lens irregularly striatulate, shining, whitish, ornamented with brown strigations above, which tend to form three bands, and with an interrupted

brown band or series of spots below; whorls 4½, a little convex, regularly increasing, separated by regularly, moderately impressed suture; body-whorl slightly dilated, subplane above, convex below, briefly deflexed anteriorly; aperture oblique, ovate-rotund, slightly lunate; peristome a little reflexed, labiate within, the margins approximating, connected by a very thin brownish callus, the basal margin at the insertion dilated, closing the umbilicus, in adults, with a brownish callus. Diam. 20, alt. 10 mill. (*Maltzan.*)

Maretimo.

All the information given by Maltzan appears above.

H. CIOFALOI Cafici, 1885.

This Sicilian species was described by Cafici in *Il Naturalista Siciliano*, 1885, p. 151. It is not figured, but is compared with *H. abræa* (Bourg.) Mabille,—a form which has not been, probably cannot be, identified with certainty. Under these circumstances, and in view of the extreme difficulty of distinguishing the species of *Iberus*, even when figured, *H. ciofaloi* had better be left in obscurity until its claims to specific distinction are made more patent.

H. SILVESTRII Cafici, is the name given to the form figured by Kobelt (Iconographie, figs. 1848–1850) as a depressed variety of *H. nebrodensis*. Figs. 53–56 of my plate 65 are copies of these figures of Kobelt. See *Il. Nat. Sicil.*, 1885, p. 152. Cafici gives no diagnosis.

H. SUBSTRIGATA (Bourg.) Mabille, 1868. *Sicily.*

Another unfigured Silician *Iberus*, probably a synonym of *H. strigata*.

H. ABROMIA (Bourg.) Mabille. *Lombardy.*

H. ABÆA (Bourg.) Mabille. *Lombardy.*

Have been identified by Kobelt with *H. muralis*.

LEVANTINA, Kobelt, 1871.

H. SPIRIPLANA Olivier, (1801 ?) Pl. 55, figs. 45, 46; pl. 66, figs. 71, 72.

Umbilicate, depressed, solid, dull above, brownish white lighter below, with five indistinct light brown girdles composed of elongated or arrow-shaped blotches; strongly, obliquely striate above, the base smoother; spire very low conic, obtuse; whorls 4½, rather rapidly widening, the apical convex, smooth, save for a microscopic granulation which is more or less visible all over the shell, the following

whorls flat, carinated, the carina fitting into the suture; last whorl convex, rounded at the periphery, indented around the umbilicus, rather abruptly deflexed anteriorly; aperture oval, very oblique; peristome expanded, white, sublabiate, the margins arcuate and converging, joined by a white parietal callus; basal margin reflexed, not adnate, partially concealing the umbilicus.

Diam. 36, alt. 19 mill.

Crete; *Rhodes*; *Palestine*.

The typical form is the small island variety of *Crete*. The large form found about Jerusalem has been called var. *hierosolyma* Boiss.

Var. CÆSAREANA Parreyss. Pl. 61, figs. 100, 100a, 100b.

This form may be distinguished by the usually completely closed umbilicus, the keel on the body whorl distinct, at least at its origin.

Var. MALTZIANA Parreyss. Pl. 55, figs. 53, 54.

Subcovered umbilicate, subdepressed, solid, obliquely arcuately rather roughly striate, opaque, whitish, marked with interrupted brown bands; spire subconoidal, apex obtuse; whorls 4 to 4½, the inner ones carinated, the last depressed, *subangulated*, (the angle becoming evanescent toward the last), anteriorly deflexed, the base not inflated; aperture very oblique, suboval, dull flesh-colored within; peristome white, the margins joined by a light callus, the right margin expanded, columellar broadly reflexed, almost entirely covering the umbilicus. Diam. 28, alt. 13½ mill. (*Pfeiffer.*)

Rhodes.

H. cæsareana var. *nana* Mouss. is synonymous.

Var. MASADÆ Tristram, 1865. *Unfigured.*

Umbilicate, depressed, solid, whitish, transversely regularly and deeply striate above and below; ornamented with evanescent brown white-interrupted zones; whorls 5, the upper carinated, plane, produced at the sutures, the last deeply deflexed; aperture oblique, rounded; peristome reflexed, expanded, frequently concealing the umbilicus.

Diam. 30, alt. 14 mill. Diam. of aperture 13, alt. 11 mill.

Sebbeh (*formerly Masada*) *Palestine*, and the most barren and sterile mountains from there to Jebel Usdum, the salt-mountain. The deep and regular striation of this shell at once distinguishes it from *H. spiriplana*, for a small variety of which (such as that which Conrad has described under the name *H. lithophaga*) it might otherwise be mistaken. (*Tristram.*)

Var. LITHOPHAGA Conrad, 1852.

Depressed convex, moderately thin; volutions 5, those of the spire flattened; suture margined by a carinated line; base convex; umbilicus rather large, but more than half covered by the lip, which is widely reflected; color whitish varied with pale-brown irregular angular spots in series of revolving lines, four on the large whorl; base without colored markings. (*Conrad.*) Diam. 32, alt. 18 mill.

Wady en-Nar, below Deir Mar Saba.

Remarkable for its habit of penetrating limestone rocks.

The species seems to me to be a synonym of *H. spiriplana.*

Var. MEDIA Mousson, 1874. *Unfigured.*

Carina evanescent; elegantly marked with zigzag white lines. Diam. 32–35 mill.

Basin of Haleb.

H. GUTTATA Olivier, (1801 ?) Pl. 55, figs. 51, 52; pl. 66, fig. 73, 74.

Imperforate or covered perforate depressed globose, solid, opaque, rather dull, fleshy whitish, with from two to four spiral girdles of very obscure brownish spots; obliquely striate, rather coarsely above, smoother below; spire slightly convex, obtuse at summit, apex rather large, smoother and more shining than the following whorls, which are almost plane, and until the last, with linear sutures; whorls 5, the last more rapidly increasing *without trace of keel,* even at its origin, deeply deflected anteriorly, scarcely indented in the center below; aperture transversely truncate-oval, very oblique, showing livid bands within; *peristome in every part reflected,* white, the basal margin straightened, callous, subdentate, expanded and almost or completely covering the umbilicus at the insertion, the terminations somewhat converging, and joined by a shining white callus. Diam. 38, alt. 22. mill.

Mesopotamia.

The italicised passages in the above description will enable one to separate this species from all of the preceding forms.

Kobelt gives as the measurements of this form: diam. 28–38, alt. 15–20 mill.

H. DSCHULFENSIS (Dubois) Bourg., 1857. Pl. 55, figs. 42–44; pl. 66, figs. 81–83.

Covered umbilicate, or imperforate, more or less depressed, solid, but thin and rather translucent, colored like *H. guttata,* irregularly

striate, whorls but little elevated, but convex; apex flat, minutely rugose; whorls 4 or slightly more, much more rapidly increasing and more convex than in typical *guttata*, the last quite rounded, and very rapidly widening; aperture very oblique, more circular than in *guttata*, its margins converging, but not joined by a callus; peristome expanded, not thickened within, white; its columellar margin arcuate, slightly thickened, expanded over the umbilicus.

Diam. 30, alt. 17 mill.

Armenia.

Described as *H. dschulfensii*. *H. djulfensis* Mouss. is the same. There are in this species, as in *H. guttata*, fine impressed spiral lines below the suture; these are, however, sometimes almost obsolete. The figures on pl. 55, (copied from v. Martens), are broader and more depressed than the specimens I have seen which are better represented by the figures on pl. 66.

H. MAZENDERANENSIS Nevill. Pl. 63, figs. 43–45.

Umbilicate, depressed, thin but strong, finely, regularly striate, excessively minutely granulate, but not spirally striate; spire depressed conoid, with large smooth blunt apex; suture distinct; whorls about 4, regularly increasing, rounded, the last widened, strongly striate above, smooth below, and indented around the umbilicus, suddenly and deeply deflected anteriorly; aperture very oblique, ovate; peristome simple, sharp, thickened with white, the ends converging, joined by a thin translucent callus; coloration extraordinarily handsome for the group *Levantina*, consisting of a yellowish white groundcolor, darker above, upon which revolve five chestnut bands; the fourth and fifth are most intense in color, sharply defined, but here and there with paler spots; the first and third are less intensely colored, narrow and interrupted; the bands are visible within the aperture, Diam. 35, alt. 18 mill.

Province of Mezanderan.

This brilliantly colored species is related to *H. dschulfensis*, perhaps is only a variety of that form. The description and figures are from Kobelt.

H. MICHONIANA Bourguignat, 1864. Pl. 55, fig. 50.

Imperforate, depressed, solid, subtranslucent, coarsely striate, covered with a yellowish corneous, very deciduous cuticle, encircled by two irregularly interrupted chestnut colored zones; spire convex, apex very obtuse, corneous, smooth, quite mamillate; whorls 5, con-

vex, rapidly increasing, separated by impressed sutures, the last large rounded, deeply descending anteriorly; aperture oblique, slightly lunate, wide transverse-oblong; peristome thickened with white, expanded, the columellar margin nearly straight, but a little curved, broadly reflexed and appressed over the umbilicus, the margins converging, approximating, united by a strong callus.

Diam. 35, alt. 21 mill. (*Bourguignat.*)

Mts. of Northern Mesopotamia and Kurdistan.

H. Kurdistana var *baschkira* Pfr. is synonymous.

Kobelt considers this form a thin-shelled local variety of *H. guttata*. It differs from *H. dschulfensis* in the greater number of whorls.

H. KURDISTANA Parreyss, 1861. Pl. 55, figs. 39–41.

More or less covered umbilicate, subturbinate-depressed solid, irregularly arcuately striate, and marked with minute impressed spiral lines, bluish ashen colored, with obsolete spiral brown bands; spire a little elevated, the apex wide, obtuse; sutures submargined with white; whorls 5, slightly convex, the last wide, subdepressed, deflexed anteriorly; aperture very oblique, lunate-rotund, fleshy-brown within, shining; peristome labiate with white, broadly expanded, concentrically striate without, the margins converging, joined by a callus, columellar margin declivous, dilated over the umbilicus.

Diam. 44, alt. 24 mill. (*Pfeiffer.*)

Kurdistan.

Of this rare form Kobelt says: "It is the largest form of the *H. guttata* series, and recalls in many respects, as Pieiffer truly remarks, a certain variety of *H. codringtoni*. From *michoniana* and *dschulfensis*, to which it stands nearer than to the type, it is distinguished by the larger size, and especially by the spiral lines; other essential differences I do not find."

H. ESCHERIANA Mousson, 1864. Pl. 55, figs. 47–49.

Umbilicate, subdepressed, rather thin, strongly arcuately striate, with a whitish-yellow deciduous epidermis, and encircled by four narrow brownish bands, interrupted by arrow-shaped white markings, (one below, one peripheral, the rest above); spire rather depressed, regularly increasing, apex purplish corneous; sutures subimpressed; whorls 5, the inner more convex than the following, the last subdilated, suddenly strongly deflexed anteriorly; aperture very oblique, nearly horizontal, broad-oval nearly circular; peristome shining, white, broadly expanded and reflexed, not appressed, slightly labiate

within, the terminations connected by a nearly free, sometimes adnate, parietal callus. Diam. 29–32 alt. 14–16 mill.

Mesopotamia.

Bears much the same relation to *H. guttata* that *Macularia campesina* does to *alonensis.*

H. BELLARDII Mousson. Pl. 66, figs. 87–89.

Covered umbilicate, globosely depressed, rather solid, and smooth, scarcely striate, brownish gray or whitish, with five brown bands interrupted with white zigzag markings; whorls 4½, the upper well rounded, sutures subimpressed, the last deeply deflexed anteriorly, subterete; aperture oblique, rotund; peristome broadly expanded, flattened, white lipped, its margins converging, joined by a thick callus, columellar margin half covering the umbilicus.

Diam. 33, alt. 20 mill. (*Mousson*).

Between Nicosia and Cerino, Ins. Cyprus.

H. GHILANICA Mousson, 1876. Pl. 67, figs. 2, 3.

Openly umbilicate, very depressed, rather thin, striatulate, nearly smooth, whitish, with four series of pale brown maculations; spire scarcely elevated, apex plane, pale corneous; suture scarcely impressed; whorls 4, rapidly increasing, the first slightly convex, the following 1½ plane, carinate and marginate at the sutures, the last wider, more descending, rounded, not angulate, at the periphery, the base flattened-convex; aperture very oblique, large, transversely oval; peristome white, broadly expanded, acute without, slightly labiate within, the margins briefly separated, joined by a thin callous lamina; basal margin broadly reflexed, more or less impinging upon the umbilicus, but not closing it. Diam. 27, alt. 12 mill. (*Mousson*).

Province of Ghilan, Persia, on the Southern shore of the Caspian.

Allied to *H. dschulfensis.* The depressed form, wide umbilicus, and sharp keel shown by the second and half of the third whorl, will distinguish this form.

H. CERATOMMA Pfeiffer, 1855. Pl. 66, figs. 90–92.

Imperforate, depressed, rather solid, finely obliquely striate and under a lens, decussated with spiral lines, with a silky luster, bluish-white, obscurely fasciate with brown; spire slightly elevated, apex corneous, obtuse; whorls 4, sensibly increasing, rather convex, the last depressed-rotund, deeply deflexed anteriorly, subplane below; aperture nearly horizontal, rounded lunar; peristome simple, the

margins subconverging, the right scarcely expanded, basal plane, broadly reflexed, much dilated over the umbilical region.

Diam. 28, alt. 13 mill. (*Pfeiffer*).

Caucasus.

The original figures of this little-known form are given.

H. ÆGOPINOIDES von Maltzan, 1884. *Unfigured.*

Open umbilicate, depressed or depressed trochiform, solid, irregularly striatulate, and under a strong lens minutely granulate; spire depressed; whorls 5, first two smooth, the following plane, very distinctly carinated, regularly increasing, the penultimate and last whorls somewhat convex, obtusely angulated, the angle almost evanescent toward the aperture; body-whorl subterete, descending anteriorly; aperture very oblique, ovate rounded, in adults scarcely lunate, with thickened, subduplicate peristome; the margins continued by a thick heavy callus, in young specimens aperture distinctly lunate, peristome acute, thin, labiate with white a distance within the aperture, margins converging, joined by a thin porcellanous callus; greenish yellowish brown, sutural carina white.

Diam. 25½, alt. 12–13½ mill.

Cape Sidero, Ins. Crete.

This species, one of the rarest of the European fauna, has the spire of *H. spiriplana*, and evidently belongs to this group. From below it has the appearance of an *Aegopina*. Very few living examples were found. (*v. Maltzan*).

Section IX. POMATIA Beck, 1837.

This section, like the preceding groups of *Pentatænia*, is wholly Palæarctic in distribution, and is especially characteristic of southwestern Europe and the adjacent portions of Asia. I have no hesitation in separating from the section the Australasian and American species which Pfeiffer groups here; as I believe that their resemblance to the European types is merely superficial.

The arrangement of species here adopted is substantially that of Kobelt's Catalogue.

The large, globular form separates *Pomatia* from the allied subgenera; it is subject to but slight modification in the various species, which are all, indeed, in general appearance very similar.

The species of *Pomatia* frequently exhibit sinistral monstrosities, and scalariform or partially uncoiled specimens are also not infrequently found. Artificial monstrosities have been produced by inserting the young *Pomatia* into the aperture of an empty shell, such

as *Limnæa stagnalis;* as the growth of the Helix proceeds, a normal globose variegated body-whorl is added to the artificial spire, and becomes solidly attached to it.

That snails have more intelligence than is usually ascribed to them is shown by the following interesting paragraphs on the *Instinct of orientation in Helix aspersa* by F. d'A. FURTADO:

"In a house which I inhabited at St. Michael's one of the Azores, there was a veranda with a flight of steps leading to a little court or garden. Above this was a second veranda supported by a stone column, which rested on the wall of the lower veranda. At the foot of the column had been set a flower-pot with a young banana bearing two or three leaves.

"One morning I noticed a snail (*Helix aspersa*) lodged between the pot and the column, as if waiting for night to attack the plant. A leaf had already been gnawed; and to stop further depredations I threw the snail into the court. It was not much the worse for the fall, as it chanced to light upon a small manure-heap. Next morning I was surprised to find the snail in precisely the same position as before, between the pot and column. I knew it by its size and color, as well as by a curious covering of spiders' webs which it bore. It was evident that the snail possessed a remarkable sense of direction, which enabled it after a violent shock, to make its way back over a distance of at least six metres in a very short time. In order to get at the bottom of the matter, I threw the snail back to the heap and watched the result, which was as follow:

"June 10, 1884—At about 9 A. M. the snail was resting, completely retracted within its shell, on the rail of the stair-case, having travelled nearly 4 metres. In the evening it resumed its march, but so slowly that by 10 o'clock it had only reached the top of the rail, where it stopped again, having traversed a metre in two hours. Twenty minutes after midnight it began to travel along the balustrade of the veranda, taking at first a very undecided course, but as soon as it reached the edge of the balustrade making straight for the banana. Halfway it was turned aside by some fish-scales, which no doubt indicated that the surface was contaminated; but it soon regained its previous direction. Near the column it fell in with a grooved washing-board, which it seemed to remember; for it reared its head and tentacles towards it, while still two centimetres off. So far two metres had been traversed in twenty minutes. The snail now advanced resolutely from the board to the flower pot, as if over

known ground (the board had lain in the same place for several days). I watched its movements by a lamp set far off so as to give only a faint light; but when it reached the pot the animal became shaded by weeds which grew there, and I found it necessary to bring the lamp near in order to observe the movements of the snail's lips and tentacles. It climbed the pot rapidly, mending its pace as it got nearer; then it examined the rim with care, and at last crawled over the mould. For a quarter of an hour it wandered among the weeds in the pot licking them frequently. When I saw it explore the soil with its lips and larger tentacles, while the reproductive orifice seemed to open from time to time, I thought that it was seeking a convenient spot to lay its eggs. At last it came up to the banana, mounted it, and began to gnaw the leaf previously attacked, exactly where it had left off before. I was standing a little way off to avoid disturbing the snail, but could readily detect the peculiar odor of the gnawed leaf. Very likely the snail could perceive, even in an uninjured leaf, that scent which only became apparent to me when the leaf was bruised or cut, and this may have helped to guide its course. Scent alone, will not, however, explain all the movements of the animal. At. 2 P. M. I left it feeding.

"June 11.—At 10 A. M. very little of the leaf had been devoured. The snail was comfortably established, as before, between the column and the pot.

"After this I noticed the snail wandering over a vine which trailed about the column and upper veranda. Finding that it was disposed to escape to the next garden, I opened it on June 17th, to see whether it was ready to lay eggs. There was not a single egg in the oviduct.

"These observations seems to show that a land-snail may possess an instinct which enables it to choose its abode and return to it at pleasure. We have here the same love of home and topographical knowledge which have been observed, and noted with wonder, in the limpet."

***

Three subsections may be distinguished:

POMATIA, *s. str.*, of which *Helix pomatia* may be taken as the type.

CRYPTOMPHALUS Moq.-Tand., 1855. Imperforate; last whorl descending at aperture; peristome in every part expanded. Type *H. aspersa*.

CANTAREUS Risso, 1826. Imperforate, thin, globular, the spire short, aperture large, peristome and columellar arcuate, thin, simple. *Lucena* Hartm., *Tapada* Gray and *Canthareus* Agassiz are synonyms.

Pomatia and *Cantareus* have calcareous, and *Cryptomphalus* membranous epiphragm.

Cryptomphalus Moq-Tand., 1855.

H. ASPERSA Müller, 1773. Pl. 58, figs. 31–38.

Imperforate, globose or globose-conic, rather strong and shining, yellowish or russet, with five bands, varying from light chestnut to nearly black, more or less interrupted by irregular or zigzag longitudinal light streaks, the second and third bands generally confluent, sometimes all confluent or all absent; obliquely coarsely substriate, all over finely malleate; whorls 4, very rapidly increasing, the apex blunt, apical whorl shining, smooth; body-whorl very large, globose, deeply deflexed at the aperture; aperture quite oblique, oval-truncate; livid within, and prominently fasciate; peristome well expanded all around, white, the margins converging, basal and columellar margins reflexed, adnate over the very narrow round perforation of the axis; columellar insertion vertical. Diam. 25–40, alt. 20–40 mill.

Southern and Western Europe; England; Syria; Northern Africa; Introduced into Canaries, Azores and Madeira Is.; Brazil; Argentine; Chili; Guiana; Cape of Good Hope; Mauritius; New South Wales; New Zealand; Haiti; Cuba; North America at Charleston, S. C., New Orleans, La., Los Angeles, Sta. Barbara and San Jose, Cal., Nova Scotia, etc.

The following are synonyms; *H. grisea* L., *variegata* Gm., *hortensis* Penn., *leucorum* Pult., *secunda* Costa., *flummensis* Lang, *adspersa* Beck and *spumosa* Lowe.

A species of very wide distribution, and great variation in color and form. The principal color mutations are figured, the figures 32, 34 and 36 representing the more usual patterns.

H. MAZZULLII Jan. Pl. 59, figs. 54–57.

Imperforate; similar in form to *H. aspersa*, but more conoid, elongated and slender in the spire; the apical whorl shining, smooth, the following very sharply crispate-striate; aperture rounded, less broad than that of *aspersa*, the lip narrowly expanded, thin, acute, adnate at the axis; color yellowish russet, plain, or five fasciate with deep brown, the bands narrow, subcontinuous, second and third often confluent. Diam. 33, alt. 35 mill.

Sicily.

The following are synonyms: *H. crispata* Costa (non Fér.), *ritiriagis* (Mke.) Cantraine, *rugosa* Mühlf. (*teste* Beck), *H. costæ* Benoit.

This Sicilian modification of the *aspersa* stock is subject to great variation in sculpture and form. In the typical *mazzullii* the diam-

eter and altitude are about equal, and the sculpture is very sharp; but forms also occur with less rough surface and traces of the malleation of *H. aspersa*. Bourguignat has called the banded form var. *zonata;* and has given the name of *H. quincaycensis* to the very narrow elevated form shown in my fig. 57. An Algierian form of *H. aspersa* is intermediate between *H. mazzullii* and *H. aspersa* in form and sculpture.

H. SUBPLICATA Sowerby, 1825. Pl. 67, fig. 99,

Imperforate, globose-conic, thin and rather fragile (fossil examamples heavier) yellowish brown, the upper two whorls deep dull reddish brown; upper whorls densely minutely granulate; the last 1½ coarsely corrugated in the direction of the growth lines; spire conic, very obtuse, the first 1½ whorls disproportionately large; suture deeply impressed; whorls 3½, the last large, globose, gently deflexed anteriorly; aperture oval, oblique, its margins converging and joined by a slight (or in fossil examples very heavy) parietal callus; peristome slightly thickened, scarcely expanded, reflexed and adnate over the axis. Diam. 32, alt. 32 mill.

Ins. Porto Sancto, Madeiras.

A curious form, very distinct from all others in the large, clumsy apex, granulate surface, etc.

* * *

Pomatia Beck, s. str., 1837.

H. POMATIA Linn., 1758. Pl. 58, figs. 39–41.

Perforate or umbilicate, globular, strong, opaque, yellowish brown or whitish, indistinctly marked with four darker zones of variable width; coarsely, irregularly obliquely striate, decussated with microscopic impressed lines; spire short, conoid, apex blunt, apical whorl smooth, shining; sutures well impressed; whorls 4½, convex, the last very large, globose, rapidly widening, indented around the umbilicus, scarcely deflexed anteriorly; aperture oblique, ovallunate; peristome slightly expanded, somewhat thickened, the columellar margin reflexed above the umbilicus; parietal wall, interior of aperture and columella white or light flesh color.

Diam. 45, alt. 45 mill.

Middle and Northern Europe.

The synonymy includes the following names: *H. antiquorum* Leach, *pomaria* Müll., *scalaris* Müll., *sphæralis* Hartm., *lucorum* Studer, *mutata* Hartm. and *inflata* Hartm.

Var. GESNERI Hartmann. Pl. 68, fig. 11.

Elevated, thick-shelled, with bands or unicolored. *Switzerland.*

H. pyrgia Bourg. is synonymous.

Var. RUSTICA Hartmann.

Covered umbilicate, globular, inflated, strongly, irregularly striate, whorls 5, rapidly increasing; sutures deep; mouth oval, peristome somewhat thickened, reddish or violaceous brown; color yellowish or reddish brown, with brown bands. Diam. 44, alt. 42 mill.

Switzerland, Southern Bavaria, etc.

Scarcely distinct from the type.

Var. PULSKYANA Hazay, Pl. 68, fig. 15.

Elevated, perforate, rough-sculptured, aperture brown lipped.

Islands of the Danube; Budapest.

Var. SABULOSA Hazay. Pl. 68, figs. 8, 10

Small, globose, variable in coloration. Diam. 33, alt. 33 mill.

Hungaria.

Var. HAJNALDIANA Hazay. Pl. 68, fig. 9.

Thin; whorls strongly convex; aperture circular, the peristome all around reflexed and white; no traces of bands. *Hungaria.*

This is var. *haynaldiana* of Kobelt's *Iconographie.*

Var. COMPACTA Hazay.

Large, globose very thick and strong-shelled; yellowish or whitish brown with four broad dark brown bands; whorls 5½, aperture higher than broad, the peristome strongly thickened, columellar margin scarcely half covering the umbilicus, flesh-colored; interior reddish-violet. Diam. 55, alt. 55 mill.

Hungaria.

Var. SOLITARIA Hazay.

Depressed globose, covered umbilicate, more depressed than the type, and broader than high; bands four, very narrow; whorls 4. Diam. 38, alt. 34½ mill.

Hungary.

H. ensarcosoma Servain is synonymous.

Var. PICEATA Gredler.

A form which is said to have the appearance of the Italian *H. lucorum* or of a cross between *pomatia* and *cincta;* frequently deep

blackish brown, unicolored; the umbilicus covered; with fine radiating more or less distinct striation.

Southern Tyrol.

Var. *brunnea* Porro is synonymous.

Var. LEDNICENSIS Brancsik.

Globose, *very thick shelled; peristome very thick*, reddish violet or flesh-colored; columellar lip broadly reflected, the umbilicus almost wide open; whorls 4–4½, regularly increasing; ground color in young examples yellowish-brown, with slightly marked bands, old specimens lighter colored with very faint bands or without them, but with several reddish or yellowish brown streaks, in the direction of growth-lines, and touched with reddish around the aperture.

Alt. 38–40 mill.

Lednicz, Hungaria.

Var. THESSALICA Boettger.

Differs from the type by the umbilicus, which is twice as wide, subinfundibuliform; the more fragile shell; bands 4–5, narrower, more or less distinct, maculated; shell large, globose, the last whorl wider; aperture distinctly higher than wide.

Diam. 47½–52, alt. 46–52 mill.

Thessaly.

Var. LAGARINÆ Adami.

This is a form of colossal dimensions and uniform dark fulvous color. Diam. 45–58, alt. 55–70 mill.

Mts. of Lagarina Valley, up to 1300 *meters alt.*

Var. PSEUDOLIGATA Paulucci. Not recognizably described.

Middle Italy.

Var. RADIATA Ulicny.

Large, covered perforate, subconic, pale fulvous, without bands, but with radiating brown strigations; rather thin; aperture oval, white within. Diam. 47, alt. 43 mill.

Brünn.

According to Clessen, this is the same as var. *rustica* Hartmann.

H. BUCHII Dubois, 1876. Pl. 57, figs. 20, 21.

Covered or nearly closed perforate, conic globose, rather thin, rugose, very pale fulvous, ornamented with five bands; spire conoid, obtuse; whorls 4½, slightly convex, rapidly increasing, the last ventricose, subdescending anteriorly; aperture oblique, large, lunate-

oval, white within and fasciate; peristome white, the margins remote, the right margin subsimple, the columellar dilated, substraightened. Diam. 50, alt. 45 mill. (*Kobelt.*)

Caucasus and Transcausia.

It is the *H. abichiana* Bayer, in coll.

This form is according to Kobelt, always to be distinguished from *H. pomatia* by the relatively lesser altitude and considerable widening of the last whorl; the spiral sculpture is less distinct; the mouth is broader than in *H. pomatia*, and the columella less perpendicular and more straightened.

H. LUCORUM Müller 1773. Pl. 67, fig. 93.

Nearly covered perforate, depressed globose, solid, opaque white with (originally) five deep chestnut bands, the second and third almost always coalescent, and frequently all above the periphery and all below coalescent, with a narrow white peripheral zone, the first band however usually separate and very narrow; marked longitudinally with occasional oblique brown streaks, more intense on the bands showing the positions of the former peristomes; lightly obliquely striate, and sometimes showing very ill defined spiral lines; spire conic, apex obtuse, unicolored, sutures moderately impressed; whorls 5, somewhat convex, gradually increasing; body-whorl large, indented around the center below, gently deflexed anteriorly; aperture oblique, rather small, lunate, colored same as the outside, peristome slightly thickened, brown, the extreme edge whitish, upper and lower margins subparallel, not converging, joined by a thin brown callus, upper and outer margins simple, basal more thickened and reflexed, columellar margin reflexed, nearly covering the umbilicus and slightly straightened within, short. Diam. 40–50, alt. 30–45 mill.

Central Italy; Balkan Peninsula; Asia Minor.

It is *H. mutata* of Lamarck.

Var. CASTANEA Olivier. Pl. 59, fig. 58.

Presents the following points of difference from *H. lucorum*: the spire is more elevated and conic, body-whorl more depressed; whorls less rapidly widening; aperture smaller, more oblique, outer lip more flaring, base with a light colored very heavy straight callus within; bands coalescent into two.

Constantinople.

H. mahometana Bourg. is a synonym.

Quite distinct and easily recognized by the conic form, small aperture and callous columella.

Var. EUPHRATICA Martens. Pl. 67, fig. 97.

Thick, heavy; bands sharply defined on a white ground; growth striæ sparse; peristome with a thin reddish-brown callus, columellar margin clear brown; umbilicus wholly closed.

Diam. 50, alt. 44 mill. (*Kobelt.*)

Mesopotamia.

Fig. 97, pl. 67, is a copy of Kobelt's figure; fig. 39, pl. 63 is said by Boettger to represent this form, but it seems to partake fully as much of the characters of var. *castanea.*

Var. RUMELICA Mousson. Pl. 67, fig. 94.

Allied, by the preponderance of the spire and the smallness of the aperture, to *H. onixiomicra*, which is, indeed only a further development of this form. It resembles, also perhaps, the var. *rumelica* as characterized by Mousson, but the umbilicus is remarkably widely open, exhibiting the second whorl within. The color is very intense; the umbilical tract flecked with brown, the fifth band, usually the most prominently defined, is broken into spots. (*Kobelt.*)

Rumelia.

The above description applies to the shell identified by Kobelt with the var. *rumelica.* I am unable to say how correctly it represents Mousson's form.

Var. ELONGATA Bourguignat. Pl. 67, fig. 96.

More elongated than any other variety; aperture short and very oblique; distinctly spirally striate beneath the suture.

Central Italy.

I follow Kobelt's identification here, as in the preceding variety.

Var. STRAMINEA Briganti.

Larger than the type, more elevated, the *last whorl very large and globose.* Diam. 45–50, alt. 45–53 mill.

Central Italy.

Var. *elongata* is scarcely distinct from this form.

Var. ONIXIOMICRA Bourguignat. Pl. 59, figs. 52, 53.

Conic, globose, narrowly perforate or covered; whorls 6–7, regularly gradually and more slowly increasing than in the typical *lucorum;* aperture small, oblique.

Diam. 42, alt. 38 mill.

Balkan Peninsula.

Compare var. *rumelica.*

Var. TAURICA (Krynicki) Mousson. Pl. 67, fig. 95.

The example here figured was sent me by Mousson as his type of *taurica*. It differs from *radiosa* Zgl. (which usually is considered a synonym of *taurica*), very materially; shows only quite indistinct traces of longitudinal streaks, but instead of them two very sharply outlined broad reddish brown bands. The columella is notably callus, with distinct lip, and the margins of the lip are joined by a thin white callus; the columella also is white, with a brown spot at its insertion. (*Kobelt.*)

H. RADIOSA Ziegler. Pl. 57, fig. 29.

Imperforate or subimperforate, globose; color-pattern a combination of spiral bands and oblique streaks of chestnut on white ground the bands diffuse and coalescent into two on the body-whorl, the longitudinal streaks predominating; upper whorls showing two or three narrow bands, the inner two whorls unicolored, corneous; body-whorl globose, indented around the axis.

Alt. 45, diam. 42 mill.

Caucasus.

Differs from *H. lucorum* in the preponderance of the longitudinal streaks over the revolving bands; there is a narrow white zone, more or less distinct, encircling the periphery; the columellar lip is partly white, partly flesh-color; the parietal callus is very thin, white.

H. SCHLAEFLII Mousson. Pl. 68, fig. 12.

Covered perforate, globose, solid, yellowish or soiled white, with five spiral brown bands, generally not sharply defined, the second and third usually coalescent, the upper and lower bands usually narrower, rudely irregularly coarsely obliquely striate and with fine irregular impressed spiral striæ; spire conoidal, apex very obtuse, smooth, shining, rather large, sutures slightly irregular, well-impressed; whorls 4½, convex, rapidly widening, especially the last; body-whorl globose, a trifle indented around the axis, somewhat descending anteriorly; aperture rotund-lunate, oblique, brownish white with brown bands within; peristome very regularly arcuate, the columella arched, outer and basal margins simple, columellar margin dilated, reflexed and adnate over the axis, deep brown in color. Diam. 51, alt. 50 mill.

Epirus.

The narrower aperture, adnate columellar lip, completely closing the perforation, and of a dark brown color, will separate this form

from *H. pomatia*, with which it has some superficial likeness. The parietal wall has a very thin brown callus.

Var. PRÆSTANS Blanc. *Unfigured.* *Janina.*

H. SECERNENDA Rossmaessler, 1847. Pl. 57, fig. 24.

Imperforate, globose, solid, whitish, with five rather narrow distinct, generally well-defined, chestnut revolving bands, the second and third sometimes subcoalescent, irregularly coarsely obliquely striate, and lightly decussated by revolving lines; spire conic, apex blunt, shining, smooth; suture well impressed; whorls 4–4½, moderately convex, rapidly increasing, especially the last, which is globose, very slightly impressed around the axis, and slightly descending anteriorly; aperture oblique, ample, brownish gray, overlaid with white within and showing the bands, rounded-lunate; peristome thickened, brown with light edge, margins not approaching, outer and basal margins subexpanded, the columellar dilated and adnate over the axis, subvertical, rather straightened, dull brown, especially at the insertion, and whitish; parietal callus thin, light brownish.

Diam. 43, alt. 43 mill.

Dalmatia.

This is *H. ligata* var. Beck, *H. ligata* of Rossmaessler's *Iconographie.*

This form differs from the last in the generally narrower more distinct bands; more thickened peristome, much less impressed sutures, and lighter colored columella. It is larger than *H. ligata*, has the columellar lip more completely appressed and colored, not white, as in the lighter form.

H. LIGATA Müller, 1773. Pl. 56, fig. 5.

Nearly covered perforate, globose-conic, subsolid, yellowish or soiled white, with five well-defined deep chestnut bands, which are generally narrower than their interspaces and usually separate; irregularly obliquely coarsely striate, and decussated with fine spiral impressed lines; spire conic, apex obtuse, smooth, unicolored corneous; sutures moderately impressed; whorls 4½, somewhat convex, rapidly widening, especially the last, and slightly descending anteriorly, a little indented around the umbilicus; aperture oblique, rotund-lunate, whitish, but showing the bands within; peristome white, its margins but slightly approaching, simple, the columellar margin

white, reflexed, dilated over the umbilicus, which is usually reduced to a narrow fissure or almost wholly covered. Diam. 32, alt. 33 mill.

Italy.

The synonymy includes *H. decussata* Parr., *melissophaga* Costa, *varians* Ziegler.

Var. GUSSONEANA Shuttleworth.

Nearly covered perforate, conico-globose, solid, distinctly, minutely reticulate, brownish white, ornamented with five brown bands; spire elevated, conoidal; whorls 5, convex, the last scarcely descending; columella arcuate; aperture rounded-lunar, shining within; peristome subsimple, the right margin a trifle expanded, columellar dilated, reflexed, white or flesh colored. Diam. 34, alt. 30 mill.

(*Pfeiffer.*) *Around Naples.*

I am unable to distinguish this variety from the typical form.

Var. CALABRICA Kobelt. Pl. 67, fig. 1.

Shell marked with five narrow rufous bands; columella and parietal wall rufous; umbilicus closed; spiral lines subobsolete.

Diam. 34, alt. 32 mill.

Calabria.

Var. POMATELLA Tiberi. Pl. 56, figs. 2, 3.

Small, very distinctly four banded. *Southern Italy.*

Var. PRÆTUTIA Tiberi.

Subrimata, depressed globose, strongly striate, solid, whitish with three broad pale fulvous bands. Diam. 39, alt. 37 mill.

Near Naples.

Var. CAMPANA Tiberi. Pl. 56, fig. 1.

Imperforate, elevated globose, glabrous, obsoletely striate, six-banded. Diam. 26, alt. 25 mill.

Near Naples.

Var. DELPRETIANA Paulucci.

Elevated, conic, white, with five very distinctly defined deep brown bands: surface rather smooth; umbilicus almost closed.

Diam. 25, alt. 28 mill.

Abruzzi.

Var. TRUENTINA Mascarini. *Unfigured.*

An intermediate form between *ligata*, *lucorum* and *pomatia*, so equally related to all that Kobelt declares it to be a mere matter of taste to which of these species it be referred.

Ascoli.

Var. PSEUDOPOMATIA Blanc.

A form from *Monte Corno* which exhibits a curious combination of the characters of *ligata* and *pomatia*.

Var. ALBESCENS Jan. Pl. 56, fig. 4.

Differs from *ligata* by the pale coloration, bands obsolete.

Italy.

H. AMBIGUA (Parreyss) Mousson, 1861. Pl. 69, fig. 30.

Imperforate, globose solid, nearly lusterless, brownish white, with five encircling rather narrow pale brown bands, the second and third generally confluent rather irregularly obliquely striate and very obsoletely spirally striate; spire conic, apex obtuse, white or corneous, smooth; suture well impressed, slightly crenulated, whorls 4½, rapidly increasing, especially the last; body-whorl large, globose, sensibly descending anteriorly, slightly indented at the axis; aperture oval-lunate, oblique, livid white and obscurely showing the bands within; peristome slightly thickened, labiate with a well-defined dark brown band within, upper and lower margins subparallel, scarcely converging, outer margin obtuse, not expanded, columellar margin expanded, dilated and adnate over the axis, deep chestnut colored, subvertical; parietal wall covered with a thin deep castaneous callus.

Diam. 36, alt. 37 mill.

Corfu; *Cephalonia.*

H. cyrtolena Bourg. is synonymous.

A specimen from Corfu, received from CONEMENOS, is figured.

Var. THIESSEANA Kobelt. Pl 69, fig. 31.

More globose than the type; shining, ruddy-brown, banded with darker, the bands scarcely visible within; interior of lip, columella and parietal wall deep castaneous, almost black.

Diam. 41, alt. 38 mill.

Chalkis, Eubœa.

A beautiful deeply colored variety. I have received it from *Achaia* from Mr. N. Conemenos.

H. ANCTOSTOMA Martens, 1871. Pl. 57, fig. 27.

Imperforate, globose-conic, spire subturrited, solid, heavy, irregularly striate, whitish gray, with two broad bands of brownish gray; whorls 5½, deeply convex, slowly increasing, the last not dilated, slightly descending at aperture; aperture slightly lunate, small,

rounded, the peristome thickened, subreflexed, brown, the columellar margin albo-dentate, terminations approximating, joined by a conspicuous chestnut-brown callus. Diam. 35, alt. 36 mill. (*Kobelt.*)

Asia Minor and Syria.

Separated from all related forms by the smallness of the aperture.

H. CINCTA Müller 1773. Pl. 57, fig. 26; pl. 69, fig. 28.

Imperforate, globose or globose-conic, solid, grayish or yellowish white with five brown bands, the upper three generally coalescent, coarsely obliquely striate, subdecussated by obsolescent spiral impressed lines; spire more or less depressed conic, apex slightly obtuse, white or corneous, unicolored, smooth; sutures well impressed; whorls 5, rather rapidly increasing, moderately convex, the last large, globose, somewhat indented at the axis and a little descending anteriorly; aperture lunate-rotund, slightly oblique, livid white and showing the bands within; peristome obtuse, labiate with dull brown, basal margin slightly expanded, columellar margin brown, straightened and callous inside, reflected and adnate over the axis; parietal wall with a brown callus.

Diam. 37, alt. 32; diam. 32, alt. 38 mill.

Northern Italy. Istria.

H. lemnescata Brumati and *H. grisea* Auct. are synonymous.

Var. POLLINII Da Campo.

Similar to the type, but pure white in color.

Dalmatia.

An albino form. Part of the specimens before me have a more opaque white peripheral fascia, in the place of the light central band of the normal *cincta*. The peristome is sometimes edged with brown.

H. ASEMNIS Bourguignat, 1860. Pl. 69, fig. 27.

Imperforate, solid, cretaceous, white or encircled by two or three obscure brown zones, coarsely striate; whorls 5, somewhat convex, rapidly increasing; the last large, dilated; aperture white, lunate-rotund, slightly oblique; peristome simple, acute, white, columellar margin reflexed, appressed, margins somewhat approximating, joined by a thin white callus. Diam. 40, alt. 40 mill. (*Bourguignat.*)

Mt. Taurus, Anatolica.

H. solida (Zieg.) Albers, is said to be synonymous.

The above description and figure are taken from the original ones of Bourguignat, and correspond exactly with specimens before me from the original locality. The shell is quite solid, opaque white,

very pale, even when banded. The bands appear subtranslucent from within. The columellar lip is expanded only in the immediate vicinity of the umbilicus, and is closely appressed over it, differing in this respect wholly from *H. ligata*, with which Bourguignat compares it. From *H. cincta* and its white variety *pollinii*, the differently formed, less expanded basal lip and columella will separate it. Kobelt has identified with this species a form of very different appearance; so different that I am inclined to believe it specifically distinct. His description (translated) and copies of his figures (pl. 56, figs. 6, 13) are here given:

Shell imperforate, globose, whitish, encircled with two or three zones, rugose-striate, slightly shining; whorls 5, somewhat convex, rapidly increasing, the last large, dilated, gently descending at the aperture; aperture lunate-rotund, white within, slightly oblique; peristome simple, thick, albolabiate within, the columellar margin reflexed, appressed, dilated over the umbilical region, joined to the upper lip by a thin callus. Diam. 42, alt. 42 mill. (*Kobelt*).

Mountains of Asia Minor and Syria.

H. MELANOSTOMA Drapernand. Pl. 56, figs. 7, 9.

Imperforate, globular, opaque, somewhat shining, brownish or fleshy white, unicolored, or with the upper part of the body-whorl slightly darker, the darker portion distinctly defined, coarsely obliquely striate, and with obsolesent spiral impressed lines; spire conic, very short, the apex minute, obtuse, corneous; sutures linear, but impressed; whorls 4, slightly convex, the inner gradually, the last very rapidly widening, globose, scarcely indented at the axis, gently descending anteriorly; aperture oblique, rotund-lunate, flesh-colored within, its margins scarcely approaching; peristome simple, obtuse, thickened, labiate within with deep brown; columellar margin deep chestnut colored, reflexed and appressed over the umbilical tract, and joining the upper margin by a conspicuous black or deep chestnut callus. Diam. 26, alt. 26 mill.

Southern France; N. Africa; Balearic Is.

Easily recognized by the compact, globose form and blackish aperture. The largest specimen I have seen (from the Balearic Is.) measures 35 mill. diam., but Bourgingnat gives for an Algierian example these measurements: diam. 42, alt. 50 mill.!

Var. VITTATA Rossmaessler. Pl. 56, fig. 10.

Conspicuously fasciate. *Egypt.*

Var. CANDIDA Rossmaessler. Pl. 56, fig. 8.

Differs from the typical form in being more elevated, chalky white, very strongly, coarsely striate. *Egypt.*

It is *H. rugosa* Anton.

Var. NUCULA Parreyss.

Imperforate, subglobose, solid, densely and sharply striate, slightly decussated under a lens, white, ornamented with brown bands sometimes obsolete; spire convex-conoid, obtuse; whorls 4–4½, moderately convex, rapidly increasing, the last inflated, regularly descending; aperture somewhat diagonal, lunate-rotund, shining within; peristome brown, the margins joined by a deep brown entering callus; right margin obtuse, basal slightly reflexed, subappressed.

Diam. 25, alt. 20 mill. (*Pfeiffer*).

Alexandria, Egypt.

It is *H. figulina* var. of Mousson.

H. FIGULINA Parreyss, 1839. Pl. 57, fig. 30; pl. 69, fig. 26.

Imperforate, globose-conoid, opaque, rather solid, white or flesh-color, five-fasciate with chestnut, the three upper bands generally very narrow, second and third often confluent, sometimes the bands are pale in color or entirely absent; densely obliquely striate, and with spiral impressed lines which are scarcely visible, or more often almost completely obsolete; spire conic, apex obtuse, corneous, shining; suture well impressed; whorls 4, slightly convex, rapidly widening, the last subindented at the axis, and slightly descending anteriorly; aperture rotund-lunar, oblique, colored the same within as the outside, shining; peristome very regularly arcuate, simple, narrowly labiate within with white, its ends not converging; outer and basal margins simple, columellar margin white, arcuate, vertical, reflexed and adnate over the umbilical tract; parietal wall covered by a very thin whitish callus. Diam. 22–27, alt. 20–30 mill.

Dalmatia; Greece; Asia Minor.

Figure 30 represents the paler form from Dalmatia. Specimens almost wholly devoid of bands I have seen.

Var. POMACELLA Parreyss, 1860. Pl. 57, figs. 22, 23.

Differs from the type in the more globose form, rounded aperture and more strongly reflected peristome.

Bosphorus.

H. PACHYA Bourguignat. 1860. Pl. 67, fig. 98.

Imperforate, globose, thick, ponderous, whitish or flesh-colored, zoned with chestnut, the zones frequently confluent above and below the periphery; obliquely striate, whorls of spire decussated conspicuously by spiral lines; spire conic, apex smooth, obtuse; whorls 5, somewhat convex, rapidly increasing, the last ventricose, obliquely plicate-striate, thick, very slightly descending anteriorly, slightly indented at the axis; aperture rotund-lunate, livid whitish or brownish, sometimes showing the bands within; peristome obtuse, the ends not converging, much thickened, not reflexed; columellar margin reflexed and appressed over the umbilicus; parietal wall with a thick callus. Diam. 33, alt. 37; diam. 32, alt. 35 mill.

Syria; Palestine.

Distinguished typically by the heavy, thick shell, coarsely plicate body-whorl, and decussate spire.

Var. TEXTA Mousson. Pl. 56, figs. 11, 12.

Larger than the type, and rather thinner.

Diam. 46, alt. 45 mill; diam. 44, alt. 50 mill.

Palestine.

H. PATHETICA (Parreyss) Albers, 1860. Pl. 63, figs. 49, 50.

Nearly imperforate, depressed globose, thin, translucent, distinctly striate, white or yellowish-white, with five brown (according to Albers, citron yellow) bands, of which the lower are the more conspicuous; spire depressed, with blunt, rather large apex; whorls 4, separated by an impressed, rather irregular suture; body-whorl large, transversely widened, somewhat inflated, rapidly and rather strongly deflected anteriorly; aperture oblique, ovate, shining and white within, and showing the bands; peristome simple, sharp, straight, labiate with white within; columella rather straight, scarcely expanded, reflected and appressed. Diam. 28, alt. 24 mill. (*Kobelt*).

Asia Minor.

Differs from *H. obtusalis* in the white peristome.

The form above described and figured differs from the species as defined by Albers in being *distinctly*, instead of "*subtilissime*" striate, and in its greater altitude. The measurements given by Albers are: diam. 29, alt. 18 mill.

H. SOCIA Rossmaessler, 1853. *Unfigured.*

Subumbilicate, depressed-globose, rather thin, obliquely striate, pale fulvous, ornamented with broad interrupted deep chestnut bands;

whorls 5½, slightly convex, sensibly increasing, the last rotund, at the periphery white-zoned, scarcely descending anteriorly, base radiately marked with brown; aperture oblique, rotund-lunar; peristome subsimple, the upper margin almost straight, lower briefly reflexed, much dilated and almost adnate at the umbilicus.

Diam. 43, alt. 26 mill. (*Rossmaessler*).

Constantinople.

I know the species only by Rossmaessler's description, above translated. He mentions a var. β. which is larger, and partly covered by a deciduous yellowish cuticle.

H. PHILIBINENSIS (Frivaldszky) Rossm., 1839. Pl. 67, fig. 100.

Imperforate, depressed-globose, rather thin, plicate-striate, under a lens decussated with spiral lines, white, with three narrow brown bands above, and two separated, wide ones below; spire slightly elevated, obtuse; whorls 4, slightly convex, the last inflated anteriorly descending, aperture oblique, lunate-rotund, within concolored; peristome simple, white, right margin deeply arcuate, columellar margin declivous, dilated, appressed. Diam. 24, alt. 16 mill. (*Pfeiffer*).

Rumelia; Macedonia.

This is *H. Philibensis* (Friv.) Pfr. (?). Rossmaessler says: "*Der name soll wahrscheinlich* Philippinensis *heisen.*"

Pfeiffer's description is given above. He gives as synonym "*H. Philibensis Friv.* in sched.! Nec *H. Philibinensis Parr., Rossm.*"

The figure represents Rossmaessler's form.

H. NILOTICA Bourguignat, 1863. Pl. 68, fig. 16.

Covered imperforate, large, globose-conic, coarsely striate, almost costulate at the sutures, pale whitish brown, and obscurely zoned with whitish; spire elevated conic, apex smooth, obtuse; whorls 5½, slightly convex, rapidly increasing, separated by an impressed suture, the last large, rotund, slightly descending at the aperture; aperture slightly oblique, lunate-rotund; peristome simple, slightly thickened, obtuse; columellar margin nearly straight, expanded, widely reflected, margins joined by a thin parietal callus.

Diam. 38, alt. 42 mill. (*Bourguignat*).

Damiette, Egypt.

H. VULGARIS (Parreyss) Rossm., 1839. Pl. 57, fig. 19; pl. 59, figs. 45, 46.

Imperforate, depressed-globose, rather thin, obliquely striate, decussated by spiral impressed lines; yellowish, with four or five deep

chestnut bands, which become purplish when slightly weathered; spire conic, obtuse, apex very large; whorls 4, the last large, globose, descending anteriorly; aperture oblique, rotund-lunate, peristome subsimple, the columellar margin chestnut colored, expanded and appressed. Diam. 27, alt. 27 mill.

Southern Russia; Crimea; Rumelia.

The synonymy is rather involved: It includes *H. obtusata* (Ziegl.) Rossm., 1838. (preoc), *H. obtusalis* Mousson et auct., *H. obtusata* (Ziegl.) Albers, 1860 (?). The first formal diagnosis published was that of Albers, in 1860; It is not certain, however, that he described the real *obtusata* (Ziegl.) Rossm., because his diagnosis does not mention the large apex, which is the most prominent character of the species. Rossmaessler simply figured, without descriptions, the *obtusata* of Zeigler and *vulgaris* of Parreyss.

Var. BICINCTA Dubois. Pl. 69, fig. 29.

Differs from the type in the more solid shell, two-banded, one band subsutural, the other surrounding the umbilical tract; columella callous, somewhat straightened; peristome thickened.

Diam. 35, alt. 30 mill.

Western Caucasus.

H. LUTESCENS Ziegler, 1837. Pl. 59, fig. 49; pl. 68, fig. 20, 21.

Imperforate or subimperforate, globose-conic, rather light thin and translucent, shining, light brownish or yellowish corneous, unicolored, or frequently encircled by pale brown bands, one to five in number; surface rather smooth, obliquely striate, and densely decussate with numerous close slightly impressed spiral lines; spire conic, obtuse, the apical whorl polished; sutures well inpressed; whorls 4, convex, the last large, globose, decidedly indented around the axis, very gently subdescending anteriorly; aperture oblique, rotund; slightly lunate, white within, the margins slightly converging; peristome obtuse, labiate within with white, outer and basal margins subexpanded, regularly arcuate, columellar margin subvertical, arched, scarcely perceptibly straightened, expanded and adnate above the umbilical tract, sometimes completely closing the perforation, sometimes leaving a considerable fissure; parietal wall coated with a very light whitish callus.

Diam. 31, alt. 33 mill; diam. 30, alt. 35 mill,

Between the Carpathian and Balkan Mts.; Transylvania; Roumania.

H. cinerascens Andrz. (*teste* Kryn.) is a synonym.

An attractive species, which may be distinguished from the preceding by the small apex. The pallid coloration, light, decussated shell, sometimes partly denuded of the very thin cuticle, are the more prominent characters.

The peristome is very narrowly expanded except at its insertion in all the specimens I have seen; but a form figured by Kobelt (pl. 68, fig. 21,) shows a considerable departure from the type in this respect.

H. NORDMANNI Parreyss, 1859. Pl. 57, figs. 16–18.

Covered or nearly covered perforate, depressed-globose, rather solid, shining, yellowish white or greenish yellow, encircled by five rather narrow deep brown bands, the second band narrowest; finely obliquely striate; spire depressed conic, excentric, apex polished, blunt; suture well impressed; whorls 4–4½, convex, regularly and moderately increasing, the last rapidly widening, very wide at the aperture, decidedly indented at the umbilical region, descending anteriorly; aperture oblique, slightly contracted, whitish, banded with dark within; peristome white or flesh-tinted, slightly thickened within, margins converging slightly, joined by a thin whitish callus, outer lip simple, columellar margin strongly arcuate, with a triangular dilation over the rather wide umbilicus, almost concealing it.

Diam. 25–28, alt. 23–26 mill.

Armenia; Imeretia.

May be known by the depressed form, rapid widening of the last whorl toward the aperture, and the umbilicus, which is quite wide for a *Pomatia*.

H. RADDEI Boettger. *Unfigured.*

A species grouping with *obtusalis, nordmanni, christophi, maltzani;* most allied to *H. obtusalis* [*H. vulgaris*] but larger, bright white, five fasciate; spire more conic, whorls more convex, separated by deeper sutures; aperture more oblique, larger; peristome more expanded, rosaceous, not brown, the basal margin broad, plane, reflexed. Diam. 38, alt. 34 mill.

The large apex and coloration are like *obtusalis*, but the convex whorls, conic spire and rosy peritreme, which is reflexed and widened below, will serve to separate the species.

Talysch, or Northern Persia.

H. CHRISTOPHI Boettger, 1881. Pl. 63, figs. 46–48.

Covered perforate, depressed globular, rather solid, rugose-striate, grayish white, variously fasciate with five brown bands; spire short

conic, apex obtuse, nucleus very large; whorls 4½, regularly increasing, sutures regularly impressed, somewhat crenulated; last whorl inflated, anteriorly descending; aperture lunate-oval; peristome labiate with white within, columellar and basal margins thickened, columellar margin callous, subdentate; parietal wall with a light callus. Diam. 32–34, alt. 26–28 mill. (*Kobelt*).

Adscharia.

Allied to *vulgaris* by the large obtuse apex, to *nordmanni* by the form, coloration, etc.

H. PRASINATA Roth, 1855. Pl. 56, figs. 14, 15.

Imperforate, turbinate-globose, striate, thin, greenish, with a deciduous epidermis, very obsoletely and narrowly fasciate; spire short, acute; whorls 4½, the upper subplane, last ample globular; aperture slightly oblique, lunate-oval, livid within, sometimes pearly; peristome simple, the margins joined by a callus, right margin straight, acute, the columella scarcely arcuate, thickened, adnate. (*Roth*). Diam. 30, alt. 31 mill.

Jerusalem.

Differs from the following species in the stronger striation, the last whorl flattened above, giving the shell a conic form; the aperture is smaller, the columellar callus much more developed; the coloration is greenish, with slight traces of bands, especially upon the upper whorls; the aperture is brownish-yellow within, without trace of bands.

H. CAVATA Mousson. Pl. 69, figs. 32,33.

Imperforate, globose-conic, solid, whitish, with light chestnut bands which are more or less suffused over the whole surface, marked in an oblique direction (at right angles to the rather coarse irregular striæ of increment,) with short, narrow clear-grayish marks, densely but obsoletely spirally striate (under a lens); spire conoid, apex obtuse smooth; suture moderately impressed; whorls 4, moderately convex, the last rapidly widening, slightly descending anteriorly; aperture oval-lunate, slightly oblique, brownish white within; peristome simple, ends scarcely converging, columellar margin slightly straightened, expanded, reflexed and closely adnate only in the immediate vicinity of the umbilicus, white; parietal callus very slight, white. Diam. 30, alt. 30 mill.

The above description is drawn from a specimen corresponding with the type figured by Kobelt. The oblique clear-grayish marks

will separate the species from the preceding and following forms, which seem to be its nearest allies. The description given by Pfeiffer here follows:

H. cavata Mousson, (pl. 57, fig. 28.) Imperforate, ovate-globose, rather solid, striatulate, dull white, with weak grayish bands; spire conoidal, obtuse; whorls 4, slightly convex, the first minute, last elongate-inflated; aperture large, oblique, lunate-oval, grayish within; peristome straight, the right margin sublabiate within, columellar margin thickened, slightly arcuate, arcuately reflexed, broadly adnate. Diam. 31, alt. 26 mill. (*Pfeiffer.*)

Palestine.

H. ENGADDENSIS Bourguignat, 1852. Pl. 57, fig. 25.

Imperforate, turbinate-globose, striate, brownish-white, with five brown bands (the second and third confluent); whorls 4, slightly convex, the first smooth, brown, the last very large, inflated, equalling ¾ the entire altitude; columella oblique, whitish; aperture oval, much higher than wide, peristome simple, acute; columellar margin dilated, reflexed, appressed. Alt. 35, Diam. 32 mill.; aperture, Diam. 18, alt. 28 mill. (*Bourguignat.*)

Dead Sea, in arid situations; Jerusalem.

H. PYCNIA Bourguignat, 1860. Pl. 59, figs. 47, 48.

Imperforate, ventricose-globose, thick, cretaceous, whitish, irregularly striate; whorls 4½, convex, rapidly increasing, penultimate and last large, globose; body-whorl slightly descending at the aperture; aperture lunate, nearly rotund; peristome white, thickened, not reflexed, acute; columella thickened, the margins joined by a thick white callus. Diam. 33, alt. 32 mill. (*Bourguignat.*)

Environs of Nazareth.

H. GODETIANA Kobelt, 1878. Pl. 69, figs. 24,25.

Imperforate, turbinate-globose, inflated, rather thin, but strong, coarsely striate, especially at the sutures; decussated by fine spiral lines, shining, dark grayish yellow, with indistinct broad chestnut brown bands, which usually leave only a narrow space between, or are entirely confluent, leaving only clear subsutural and circumumbilical tracts; spire short conoid, with conspicuous large blunt apex; suture deeply impressed, distinctly crenulated; whorls scarcely 4, the upper slightly convex, the last inflated, at first gradually, then more strongly deflected anteriorly; aperture oblique, lunate-circular, the peristome simple, the margins scarcely converging,

outer and basal margins well rounded, columella straighter, thickened, joined with the superior margin by a thin callus; aperture within deep brown, in banded examples showing the zones, and more or less distinctly white edged.

Diam. 43, alt. 37 mill.; Diam. 36, alt. 32 mill. (*Kobelt.*)

Amorgos and Santorin, Grecian Archipelago.

H. latecava Mousson, mss. is synonymous.

The Amorgos form is large, unicolored, indistinctly sculptured on the last whorl; the specimens from Santorin are smaller, with indications of bands, higher spire, sharper sculpture, smaller aperture, and the basal margin distinctly reflected.

H. MALTZANI Kobelt, 1883. Pl. 59, figs. 50, 51.

Narrowly rimate-perforate, turbinate-globose, rather solid, rugose or costulately striate, decussated by microscopic fine spiral lines, grayish yellow, ornamented with five more or less distinct chestnut bands; spire short conoidal, apex large, obtuse, smooth; suture impressed, crenulated, whitish-margined; whorls 4½, slightly convex, the last inflated, descending anteriorly; aperture rotund-lunate, slightly oblique; peristome simple, slightly thickened, distinctly labiate, the margins scarcely converging, parietal callus none or very thin; columellar, basal and outer margins regularly arcuate, the columellar, at its insertion above the perforation, arcuately reflexed; fauces brown, sometimes with translucent bands.

Diam. 37–41. alt. 36–40 mill. (*Kobelt.*)

Near Smyrna.

Distinguished from *H. godetiana* by the distinct umbilical fissure, sharper striation, etc.

***

Cantareus Risso, 1826.

H. APERTA Born, 1780. Pl. 58, figs. 42–44.

Imperforate globular, thin, shining, brown, olive, or greenish irregularly, sometimes quite coarsely, striate; spire very short, apex minute, smooth; sutures well impressed; whorls 3–3½, very rapidly widening, the last globular, slightly descending anteriorly; aperture over ⅔ the entire altitude, ovate-lunate, oblique, whitish within, outer, basal and columellar margins regularly arcuate, thin, very narrowly subexpanded, the parietal wall and umbilical tract covered by a very delicate whitish callus. Diam. 18–26, alt. 20–30 mill.

Southern Europe; Algiers.

The synonyms are *H. terrestris* Forsk., *neritoides* Chemn., *naticoides* Drap., *karalitana* Prunn (*teste* Villa).

A common species, easily recognized by its bubble-like form and large aperture; the epiphragm is calcareous, white, very convex, as if inflated from within (as, indeed, it is), and situated at the edge of the aperture; the animal is deep black in color, the central region of the foot below lighter.

H. TRISTIS Pfeiffer, 1845. Pl. 68, fig. 13,14.

Imperforate, globose-conic, thin and light, olivaceous yellow, five-fasciate with dark chestnut, densely obliquely striate and finely decussated by spiral impressed lines, especially above; spire short, conoid, apex rather large and very obtuse; sutures well impressed; whorls 4, slightly convex, the first rather large, the last large, inflated, indented at the axis, a little deflected anteriorly; aperture oval-lunate; peristome simple, very slightly thickened, outer, basal and columellar margins regularly arcuate, the latter narrowly reflexed and adnate over the umbilical perforation.

Diam. 20, alt. 18–22 mill.

Corsica.

H. ceratina Shutt. is synonymous.

Connects *H. aperta* with the typical group of Pomatia.

H. AGGERIVAGA Mabille, (*Guide Nat.* 1880, No. 3.) *Unfigured.*

Corsica.

The description of this species, said to be intermediate between *aperta* and *aspersa*, is not accessible to me.

***

The following species are unknown to me; and are probably, for for the greater part, spurious. The manner of species-splitting indulged in by the "*nouvelle ecole*" conchologists is shown in the following remarks of M. Bourguignat, prefatory to his *Description de quelques espèces italo-pomatiennes de la serie des H. ligata et lucorum*, in *Miscellanées Italo malacologiques*. He says: "Je connais 162 espèces d'Helix du groupe des *Pomatia*. Sur les 162 espèces, j'en possède 151. Onze seulement manquent a ma collection." etc., etc. And then follows a classification of the group into "*deux grandes sections* and nineteen series of species. Compare Kobelt, *Cat. eur. Binnenconch.*, who admits but thirty-three species!

The following names are from "*Miscellanées Italo-malacologiques*," J. R. Bourguignat, 1883.

H. JAUBERTI Bourg. *Syria.*
H. EDROEA Bourg. *Syria.*
H. YLEOBIA Bourg. (= *lucorum* Müll.) *Tricarico.*
H. VIRAGO Bourg. (=*lucorum* Müll.) *Italy.*
H. RYPARA Bourg. *Northern Italy.*
H. NIGROZONATA Bourg. *Northern Italy.*
H. ATROCINCTA Bourg. *Northern Italy.*

The following are from "*Species Noviss. Moll. in Eur. Syst. detectæ*" etc., J. R. Bourguignat, 1876.

H. SCHAHBULAKENSIS Bourg. *Armenia.*
H. STRAMIMFORMIS Bourg. *Italy.*
H. EQUITUM Bourg. *Rhodes.*
H. LUYNESIANA Bourg. *Syria.*
H. DICHROMOLENA Bourg. *Italy*
H. INTERAMNENSIS Bourg. *Italy.*
H. GIULIÆ Bourg. *Malta.*
H. MELANONIXIA Bourg. *Mascara, Algiers.*

The following names are from Arnould Locard's "*Cat. gen. des Moll. Viv. de France,*" 1882.

H. KORÆGÆLIA Bourg.
Provence, Italy, Corsica, Asia Minor, Greece, etc.
H. PROMÆCA Bourg. *France, Tyrol, etc.*
H. PACHYPLEURA Bourg. *Grasse, France.*
H. UTICENSIS Letourneux et Bourguignat, *Prod. Mal. Tunisie*, 1887, (= *melanostoma*). *Tunis.*

APPENDIX.

RHAGADA.

On account of the position assigned this group by Pfeiffer, with Tachea, Eremina, etc., the species were illustrated on pl. 36 of this volume. Further study has convinced me that they group with an entirely different stock; and I shall therefore treat of them in a future volume of the MANUAL.

XEROLEUCA.

P. 22, after *H. mogadorensis* Bourg., should follow.

H. CYCLOSTREMOIDES Sowerby, 1888. Pl. 68, figs. 22, 23.

Widely, perspectively umbilicate, depressed, soiled white, currugated; spire concavo-depressed; whorls 5, rapidly increasing, first two smooth, brownish, the following concave, margined with an elevated

serrulate carina; body-whorl acutely tricarina, the median carina largest; aperture hexagonal; peristome acute, triangulate.

Diam. 11, alt. 6 mill. (*Sowerby*).

M'tul, between Morocco and Mazagan.

The affinities of this apparently valid species are indicated by the position I have assigned it.

COCHLICELLA, p. 31.

H. OPPOSITA Mousson, 1887. Pl. 67, fig. 7.

Perforate, short elongate-conic, unequally striate, shining, pale corneous; spire regular, conic, summit minute, obtuse; suture linear, somewhat impressed; whorls 7¼, slowly increasing, moderately convex, the last rounded, equalling ⅓ the entire altitude, a trifle compressed at the axis; aperture suboblique, (25° from the axis) broad lunate-oval; peristome straight, obtuse (?); margins remote, joined by an indistinct lamina, the outer and basal nearly equally arcuate; columella straight, subincrassated, obvious, half covering the perforation, deeply inserted. Diam. 4½, alt. 8 mill. (*Mousson*).

Upingtonia, south of Ondonga, S. E. Africa.

Based upon a single individual, and placed by Mousson with considerable hesitation in this genus. It has the appearance of a young *Buliminus*.

ACUSTA, p. 47.

H. VAGOINA Gredler, 1888.

Half-covered perforate, trochoid, spire obtuse-conic, (the apex broken on the specimens before me) corneous-whitish, solid, plicate-striate, transversely strigate with whitish, rufo-fasciate, somewhat shining; whorls 5 (?), rapidly increasing, convex, the last inconspicuously subangulated at its origin, slightly deflexed, anteriorly, but little convex below, trifasciate, the first band obsolescent, paler, the second above, and the third below the periphery, wide, rufous-chestnut, interrupted with elevated whitish strigations; aperture oval, small, the parietal wall not deeply intruding, sinuously recurved in the middle, peristome sharp, slightly expanded, and slightly sublabiate within; columellar margin short, the junction with basal margin somewhat angular, reflexed half over the perforation.

Diam. 17, alt. 19 mill. (*Gredler.*)

District of Patong, or Shi-shia-ho, S. W. Hupé.

The name ARMANDIA has been proposed by Ancey (*Il. Nat. Sicil.*, 1883. p. 4) for *H. davidi* Desh. *H. nora* H. Ad. etc. The consideration of this and other recently proposed subgenera of this group will be deferred until the last volume of this series (VI) treating of the Helices.

PLECTOTROPIS, p. 51.

Dr. von Möllendorff has instituted for a number of northern and middle China shells, included principally in *Plectotropis* in this work, the group CATHAICA. The first species enumerated, *H. pyrrhozona* Phil., may be considered the type. The group will be further considered in the last volume treating of the Helices in this series.

Additional species.

H. SUBCONELLA Möllendorff, 1888.

Moderately umbilicate, conoid-depressed, thin, subtly arcuately striate, decussated with very fine spiral lines, and with membranaceous interrupted deciduous costulæ; corneous brown; whorls 6, slightly convex, spire subregularly conoid, last whorl acutely carinated at the periphery, base slightly inflated, obtusely angulated around the umbilicus, very briefly deflexed anteriorly; aperture oblique, lunate-trapezoidal; peristome above scarcely expanded, basal margin sinuous, a little reflexed, at the columella reflexed and slightly dilated. Diam. maj. 12, min. 10½, alt. 6½ mill.

(*Möllendorff.*) *Lien-dsou, Southern China.*

H. LOFOUANA Mlldff., 1888.

Somewhat widely umbilicate, depressed, rather solid, arcuately striatulate, decussated with fine but distinct spiral lines, with membranaceous deciduous interrupted costulæ sometimes elongately ciliose at the periphery; silky, corneous yellow; spire convex-conoid; whorls 6½, a little convex, the last with an exserted subcrenulated carina at the periphery, convex below, obtusely angular around the umbilicus, briefly descending anteriorly; aperture oblique, axe-shaped; peristome above lightly expanded, basal and columella margins labiate, a little reflexed. Diam. maj. 14½, min. 13, alt. 8 mill. (*Möllendorff*).

Lo-fou-Shan Mts., China.

AEGISTA, p. 59.

H. VIRILIS Gredler, 1888.

Moderately umbilicate, globose-trochoidal, apex slightly obtuse, slightly and irregularly obliquely striatulate, thin, pellucid, shining, vitreous like agate, violet-white, unifasciate with brown or whitish; whorls 7, gently increasing all the way to the base, slightly convex, the last obtusely angulated, descending anteriorly as far as the inferior band, slightly flattened, ornamented with two castaneous bands, one thin situated upon the angle, the other inferior, fading out toward the umbilicus, the two separated by a milky peripheral band of double the width; aperture oblique, rotund-lunar; peristome a little expanded, very briefly reflexed, the columellar margin dilated above the umbilicus, which it does not conceal, reflexed.

Diam. 14–15, alt. 9–9½ mill. (*Gredler*).

Patong, China.

Var. SUBFUSCA Gredler.

Corneous-brown or reddish-brown, with a broad white peripheral band; spire more depressed; umbilicus wider and striation stronger than in the type. The breadth of the umbilicus is quite variable.

H. LAURENTII Gredler, 1888.

Moderately umbilicated, convexo-globose, unequally striatulate, thin and pellucid, shining, corneous, concolored; whorls 4½, rapidly increasing, convex, the last large, anteriorly not descending; suture impressed; aperture large, subrotund, slightly oblique; peristome a little expanded, not reflexed, scarcely thickened.

Diam. 11, alt. 6 mill.

Hupé, China.

H. HUPEANA Gredler, 1886. Pl. 66, figs. 78–80.

Dextral, orbicular-discoidal, spire depressed, convex; thin pellucid, widely umbilicate, densely but unequally striate, somewhat shining, corneous; whorls 6–6½, a little convex, sensibly increasing, the last descending slightly or not at all, angulate above the periphery, the angle sometimes whitish, base cylindrical; aperture rotund-lunar, oblique; peristome broadly expanded all around, reflexed, acute, thickly labiate, margins converging, rarely joined by a thin parietal callus. Diam. 13–17, alt. 5–6 mill. (*Gredler*).

Patong, Western Hupé, China.

LYSINOE.

P. 75, subsection *Odontura*, after *H. eximia* Pfr. insert

H. HUMBOLDTIANA Valenciennes, 1841. Pl. 69, figs. 34–36.

Narrowly umbilicate, depressed-globose, rather thin but solid, opaque, with a very thin yellowish-brown cuticle, encircled by three dark chestnut bands, which are narrower than their interspaces, two above, one below the periphery, more or less interrupted by longitudinal irregular whitish streaks; rudely, irregularly striate, completely covered by a dense fine granulation; spire low conoid, excentric, with blunt apex and smooth polished first whorl; sutures well impressed; whorls 4½, well rounded, rapidly increasing, especially the last, which at the aperture is double the width of the penultimate; body-whorl large, depressed-inflated, deeply indented around the umbilicus, descending anteriorly; aperture rotund or oval, lunate, quite oblique, pinkish-white and showing the bands within; peristome obtuse, slightly labiate, regularly arcuate, its terminations converging, outer and basal margins subexpanded, columellar margin at its insertion triangularly expanded, adnate above the umbilicus, which it narrows and conceals more or less, joined to the superior margin by a light white callus. Diam. 33, alt. 28 mill.

Central Mexico.

H. badiocincta Wiegm., mss., teste Pfeiffer, is synonymous.

A beautiful species formerly classed in *Pomatia*, but doubtless belonging in *Odontura*. It is quite variable in proportions, a large specimen before me measuring: diam. maj. 40, min. 28, alt. 34 mill.

In this large form the shell is transversely expanded, the whorls obliquely flattened above, giving the spire a conoid shape, and the aperture is transversely oval. The thin cuticle exfoliates very readily.

Var. BUFFONIANA Pfeiffer, 1845. Pl. 69, fig. 37.

More coarsely obliquely striate, thinner, less distinctly granulate, darker in color, the bands indistinct, reduced to two, last whorl more inflated, peristome less expanded. Diam. 37, alt. 35 mill.

It is *H. humboldtiana* Desh., *nec* Val., *H. matronula* Wiegm. mss., *teste* Martens.

CAMPYLÆA.

P. 117, subsection *Chilotrema*, insert under *H. lapicida* L.

Var. MEDALPEDENSIS Clessin, 1879.

Smaller, with flat spire, the whorls more convex below than in the type.

Province of Medalped, Sweden.

In lat. 62 ° N., the most northern point reached by the species.

EREMINA.

P. 127, after H. DESERTORUM *dele* Pl. 46, fig. 63.

After var. HEMPRICHTII, instead of *Pl.* 36, *fig.* 25, read *Pl.* 35, *fig.* 19.

In the text I considered *H. chilembia* Bourg. a form of var. *hemprichti*, on account of a series which seem to connect the extreme forms. It may be better to admit the form as a distinct variety.

Var. EHRENBERGI Roth, 1839. Pl. 36, fig. 25.

Inflated, cretaceous, the peristome expanded, thickened, produced and duplicated beyond the expansion.

Var. *chilembia* Bourg. is a synonym.

H. DUROI Hidalgo p. 128.,

Var. MINOR Kobelt, 1888. Pl. 46, fig. 63.

Smaller than the type, less transversely dilated.

Diam. 27, alt. 17 mill.

Rio d' Oro, Western border of the Sahara.

MACULARIA, p. 140.

After H. EMBIA, add. Pl. 61, figs. 13–15.

NOTE. The first three numbers of the present volume, each comprising 64 pp. text and accompanying plates, were issued upon the following dates: 1, March 16; 2, July 1; 3, October 1.

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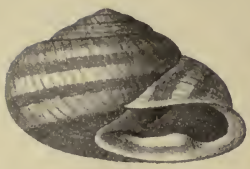
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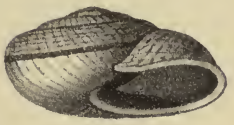
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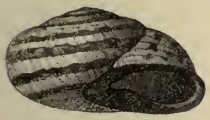
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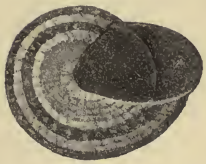
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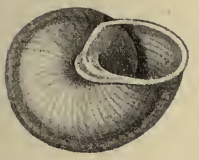
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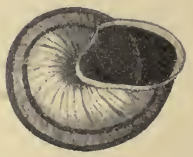
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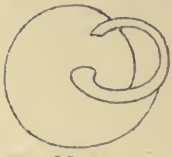
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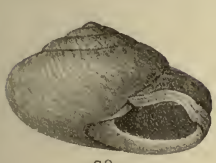
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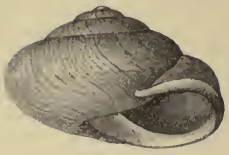
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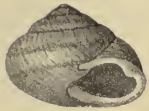
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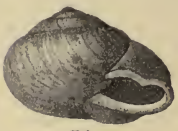
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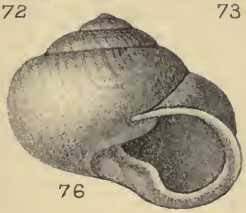
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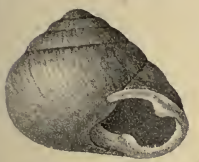
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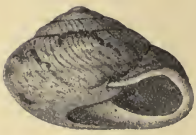
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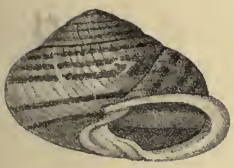
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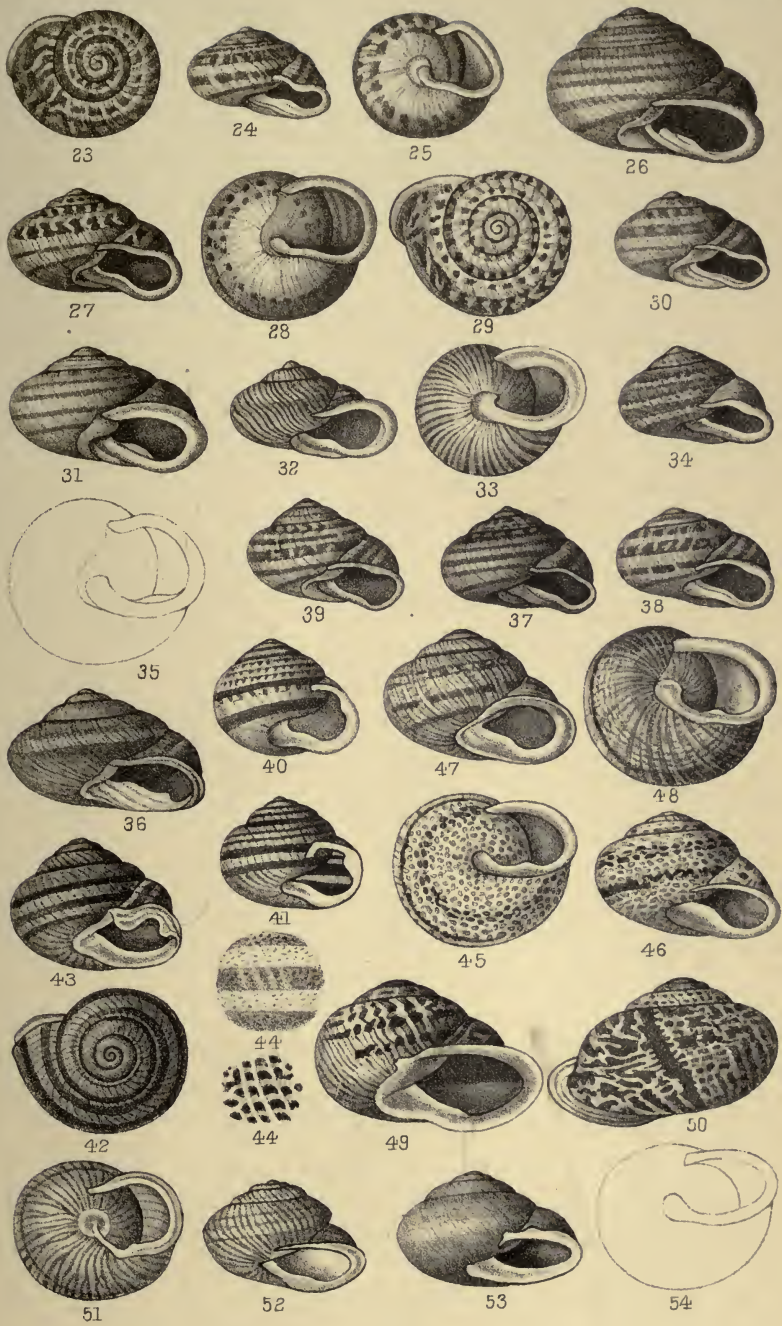
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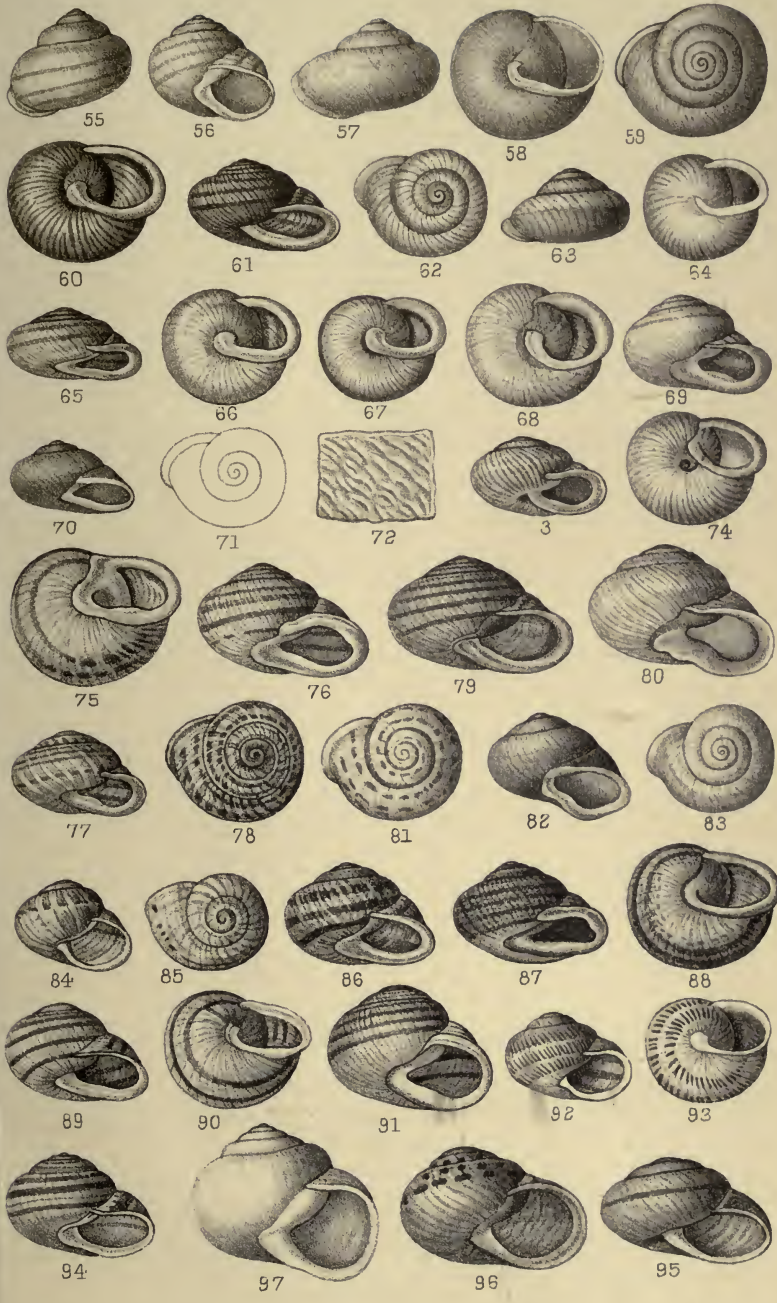
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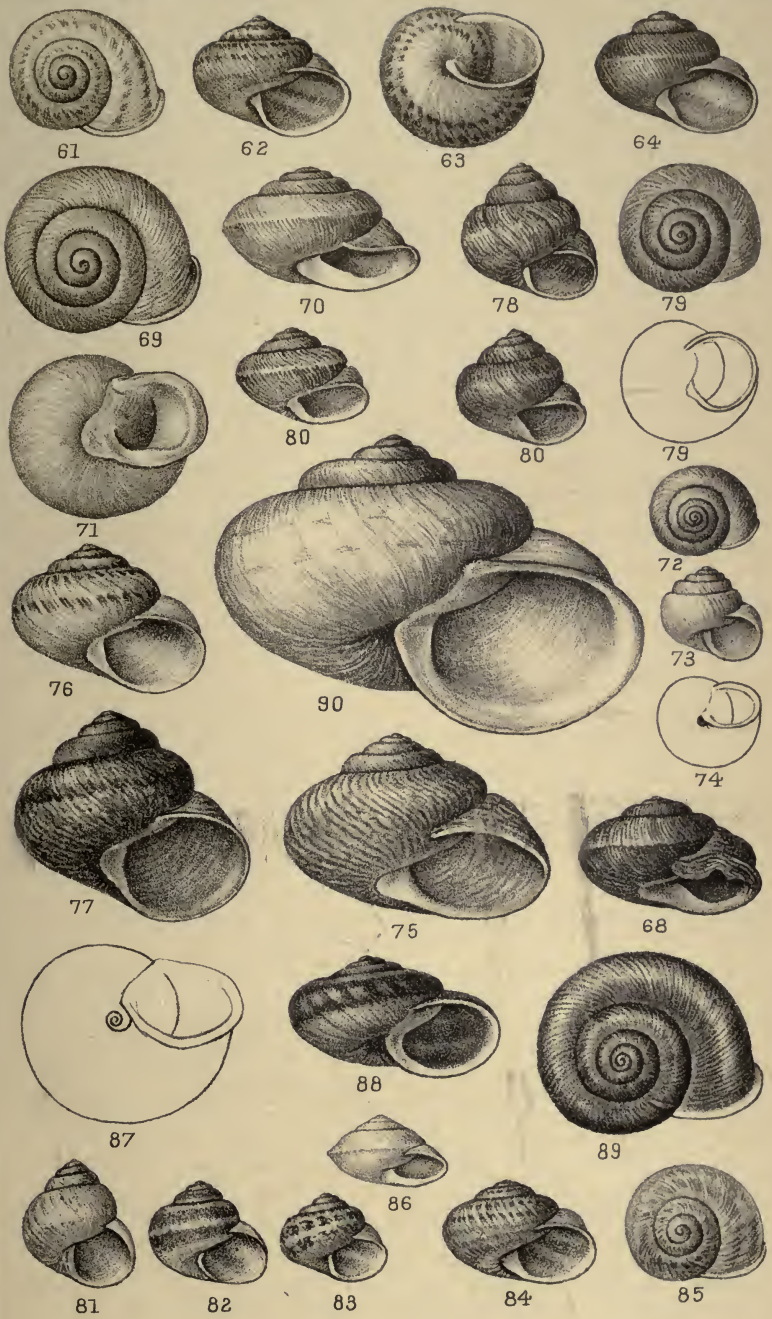
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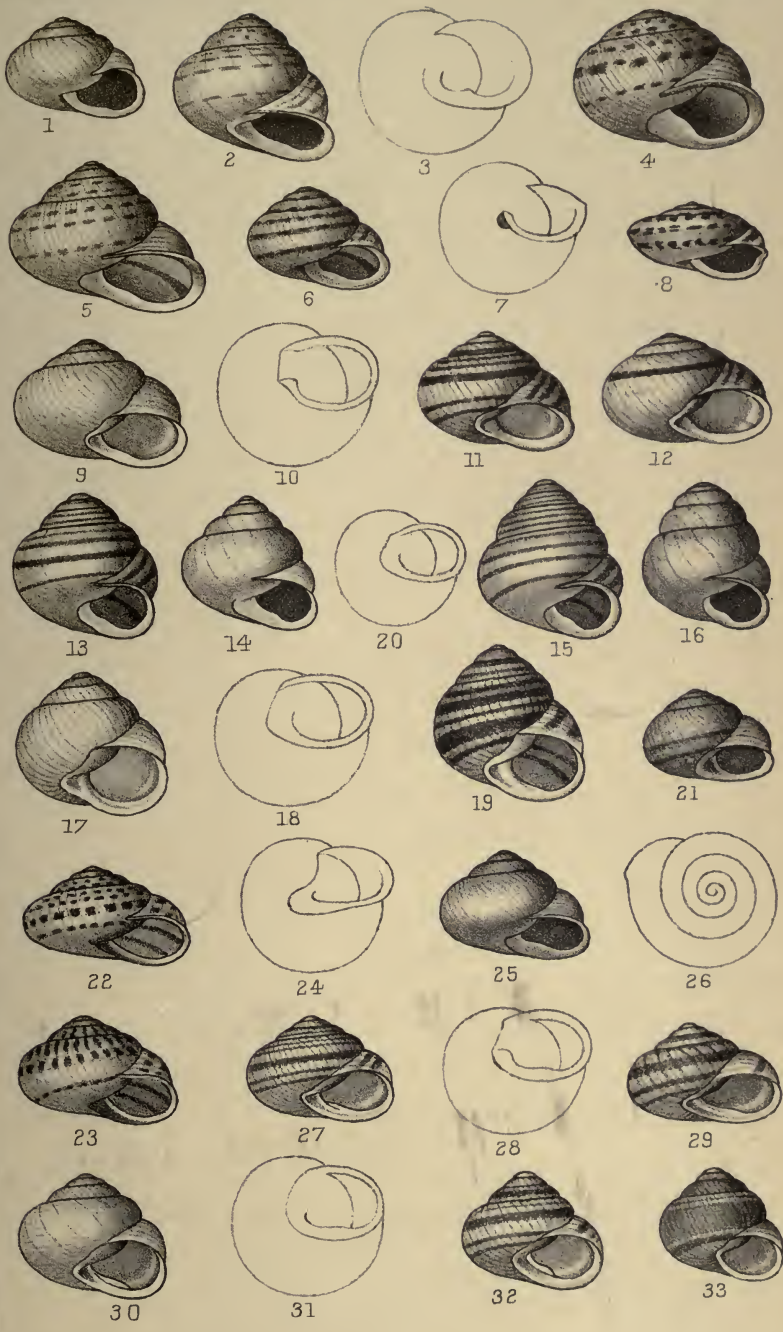
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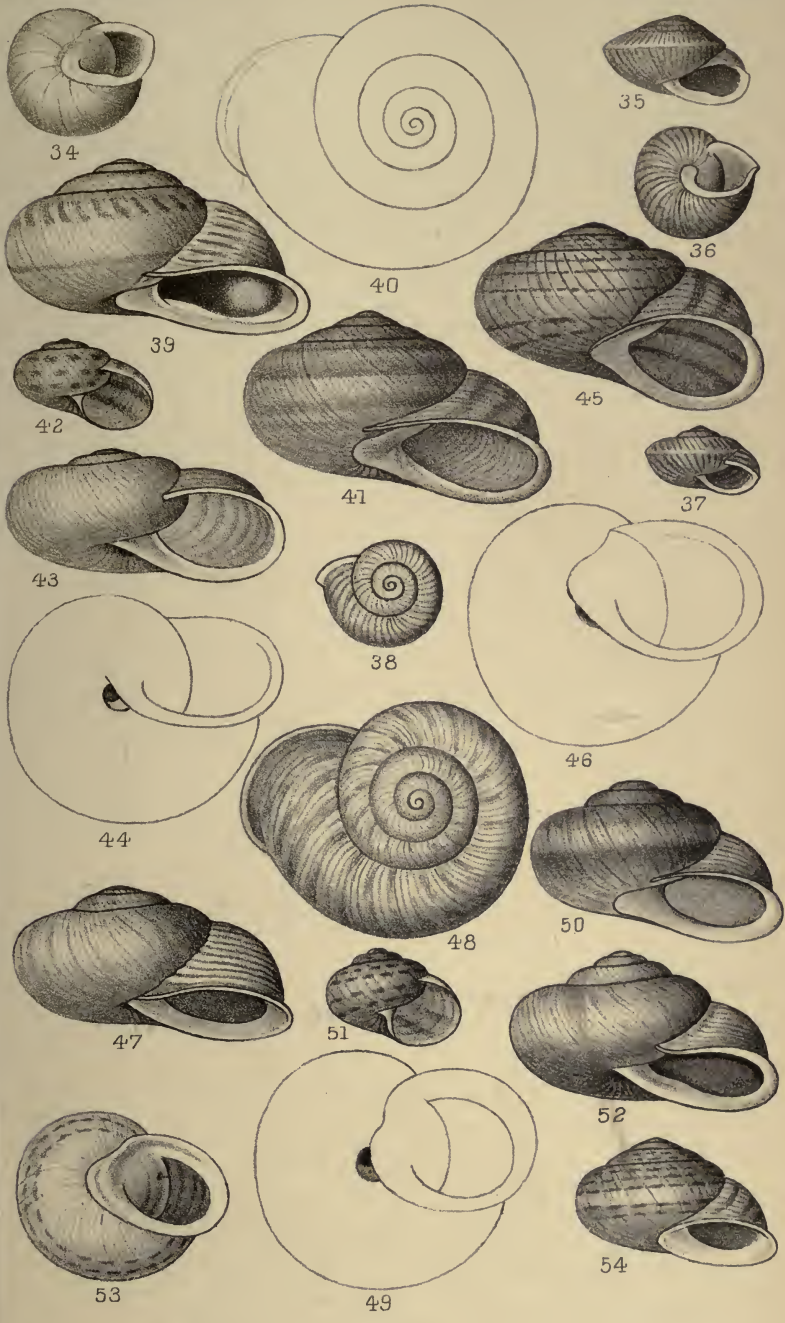
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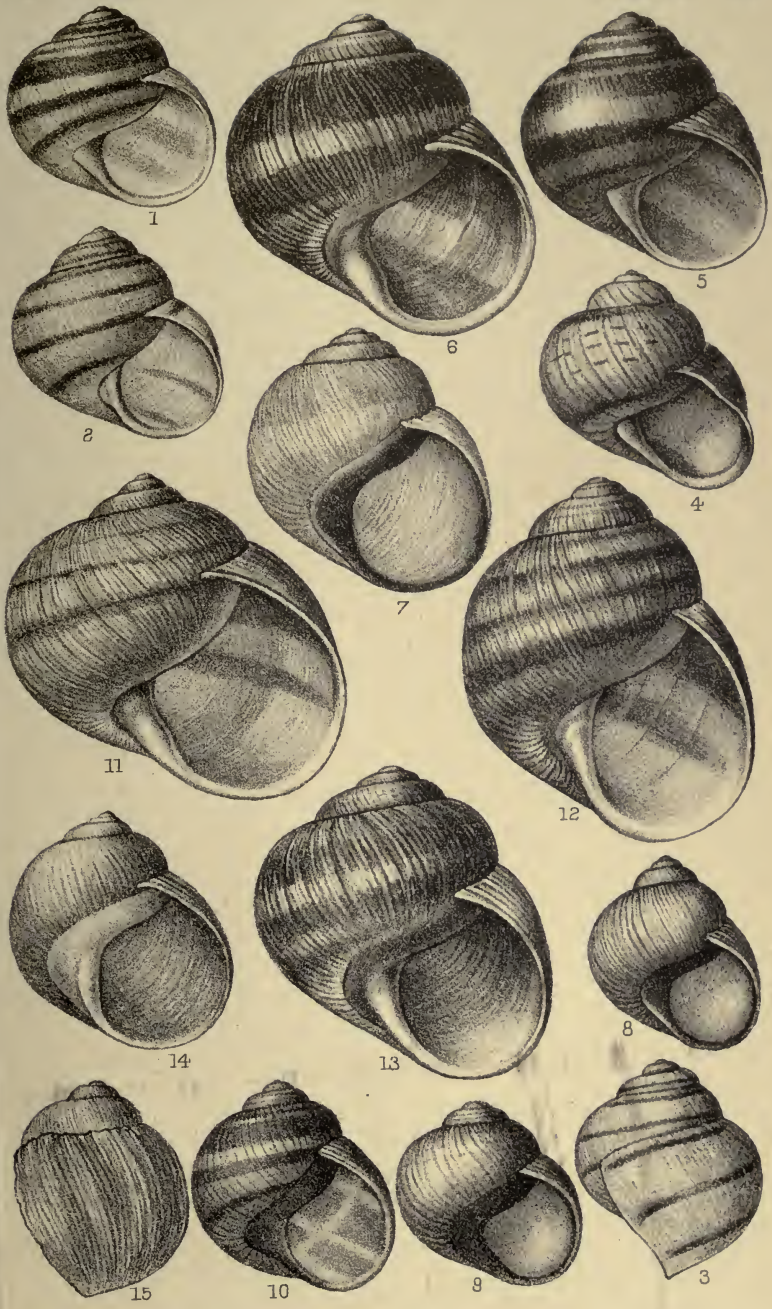
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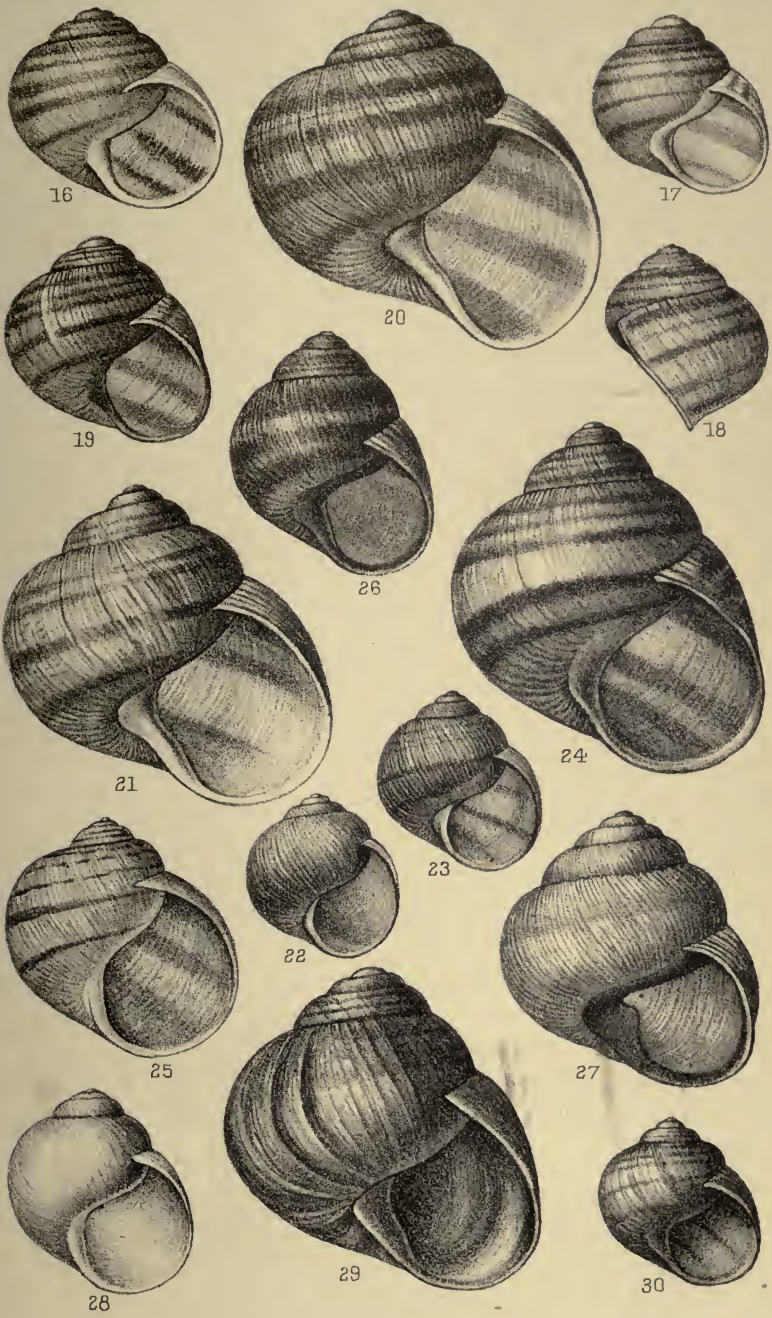
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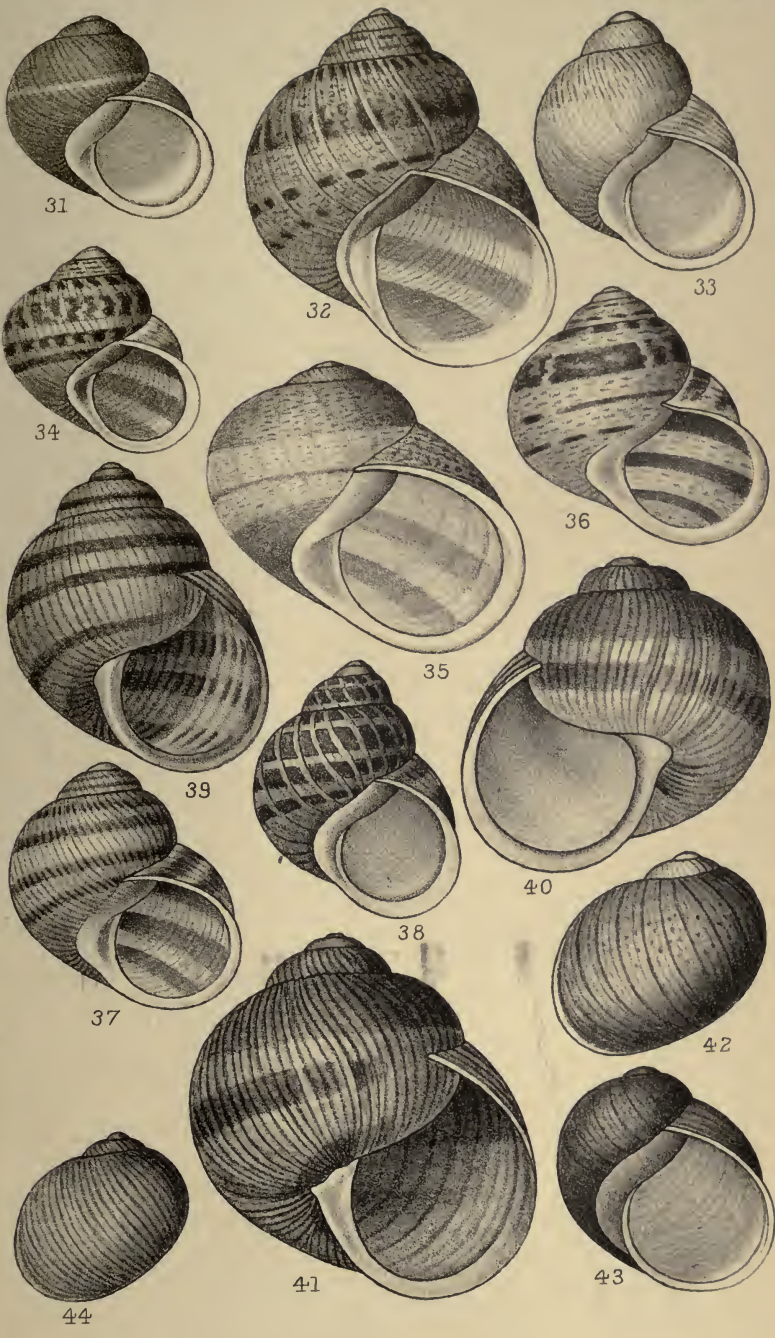
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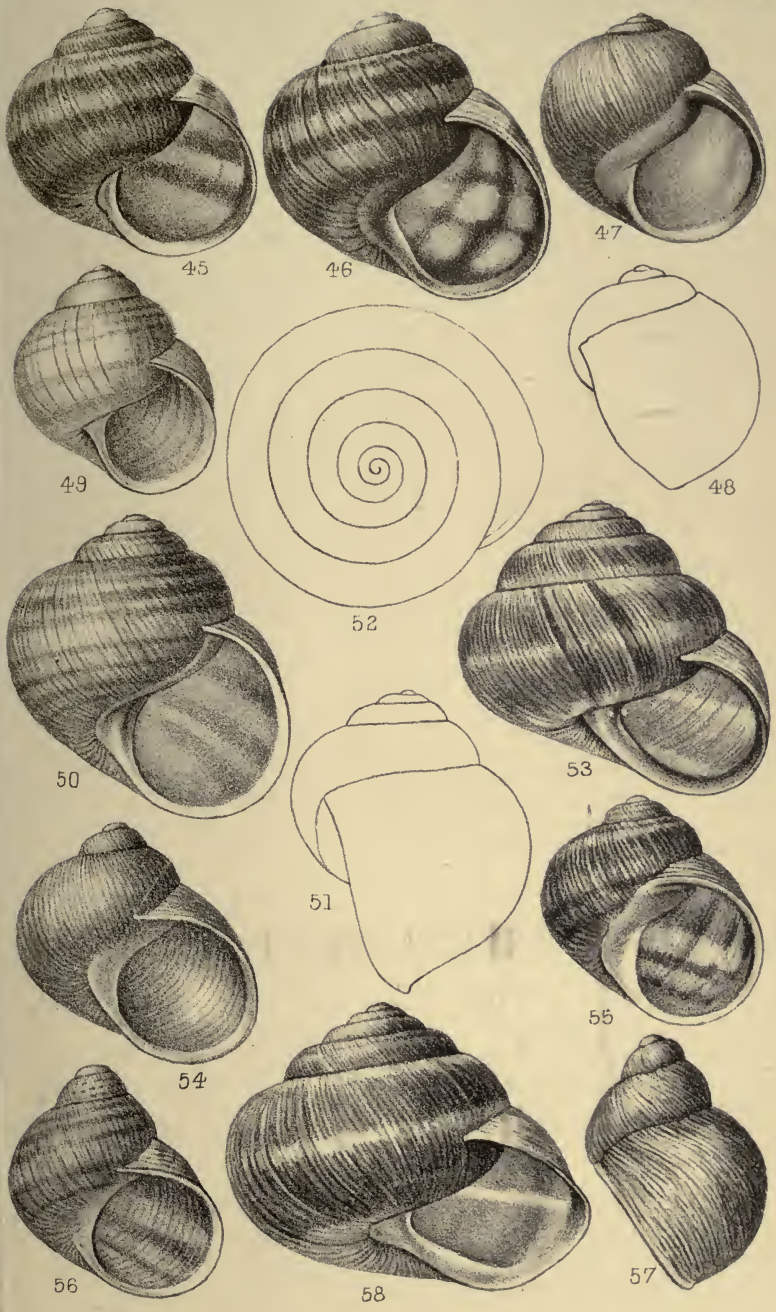
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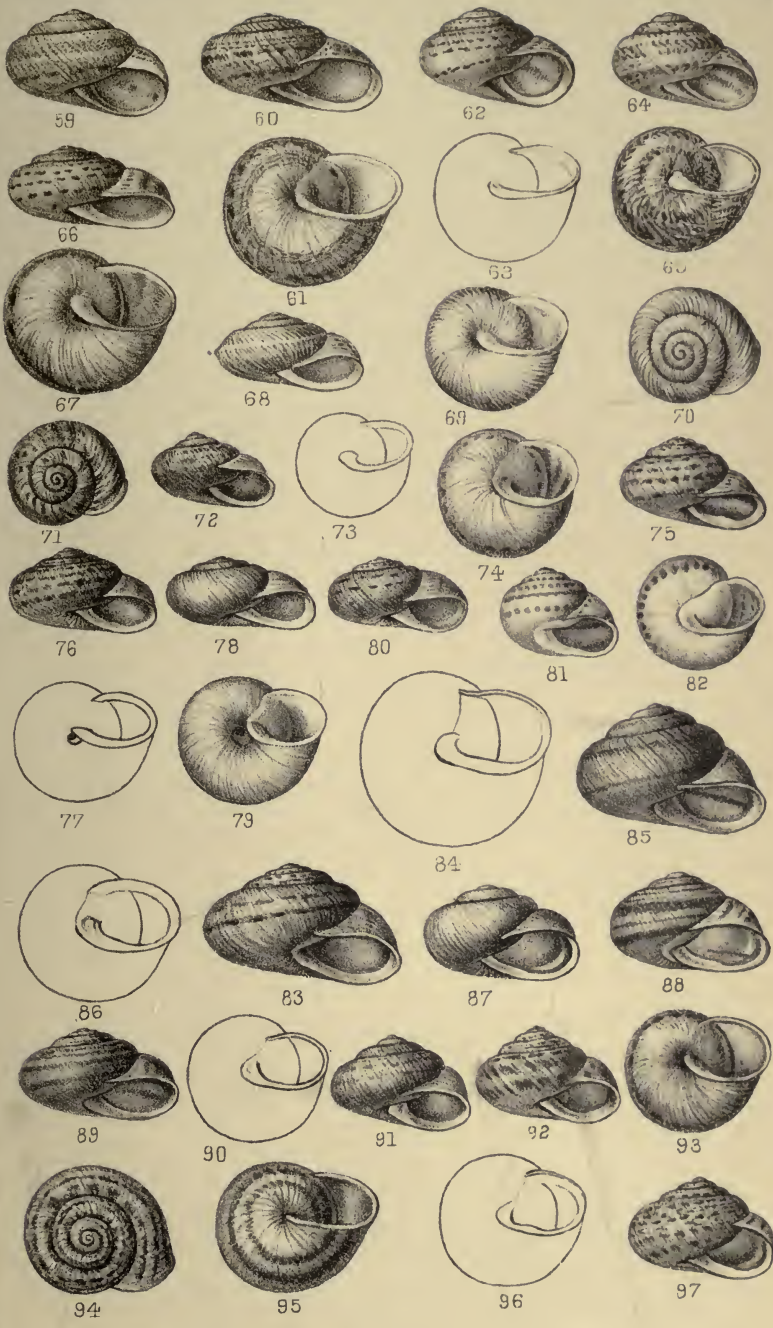
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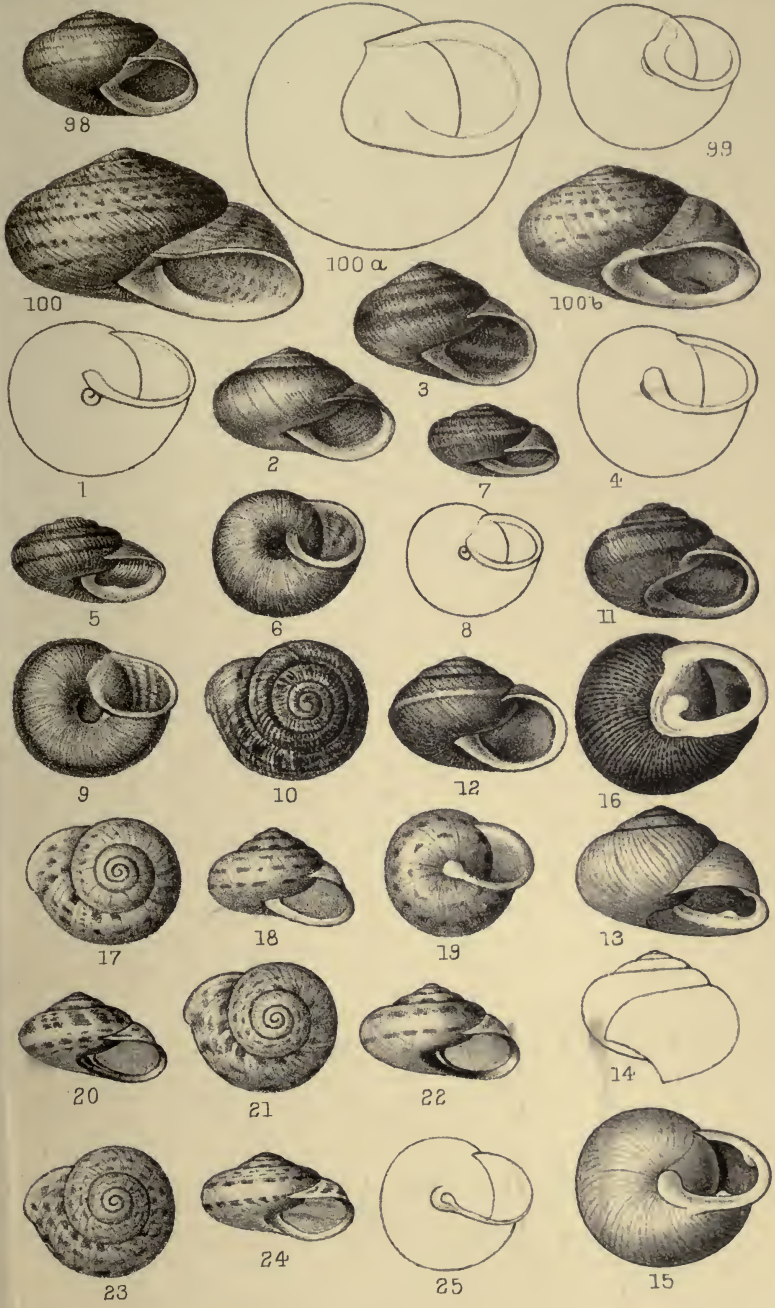
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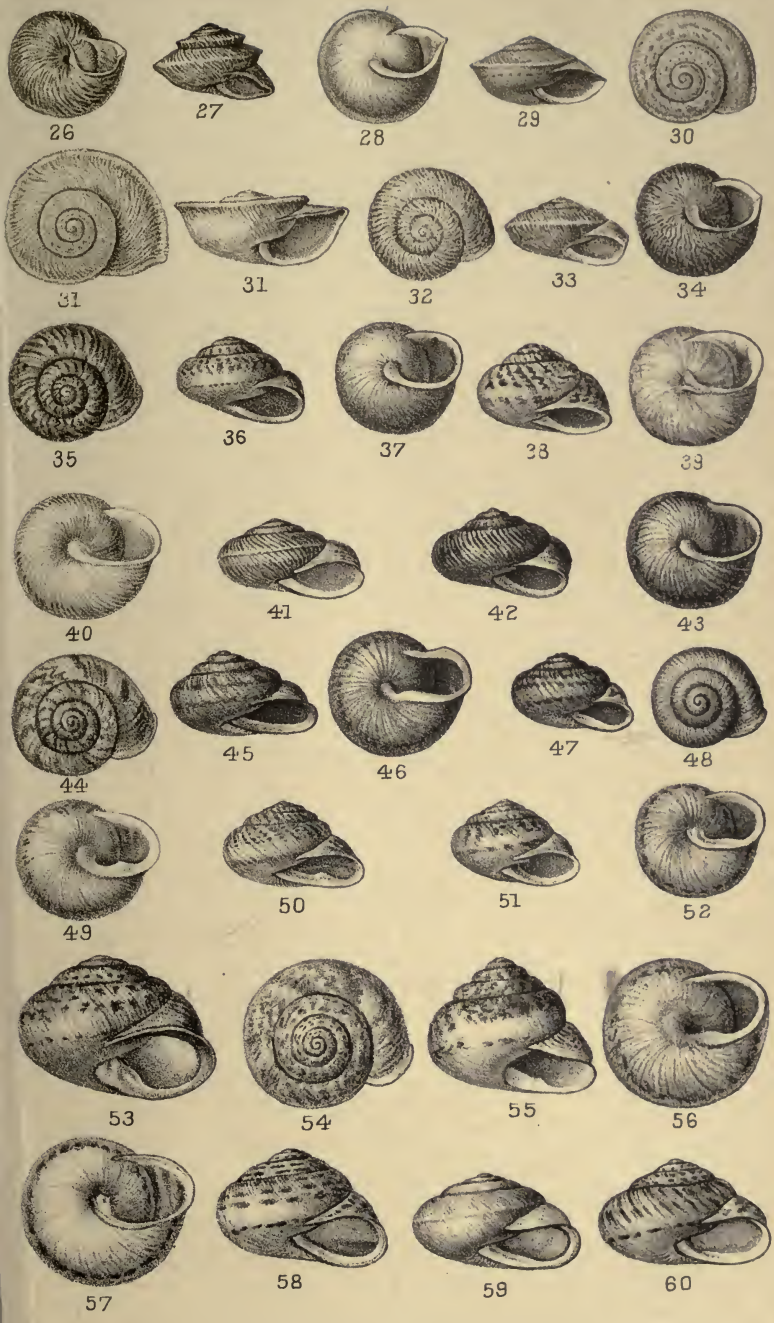
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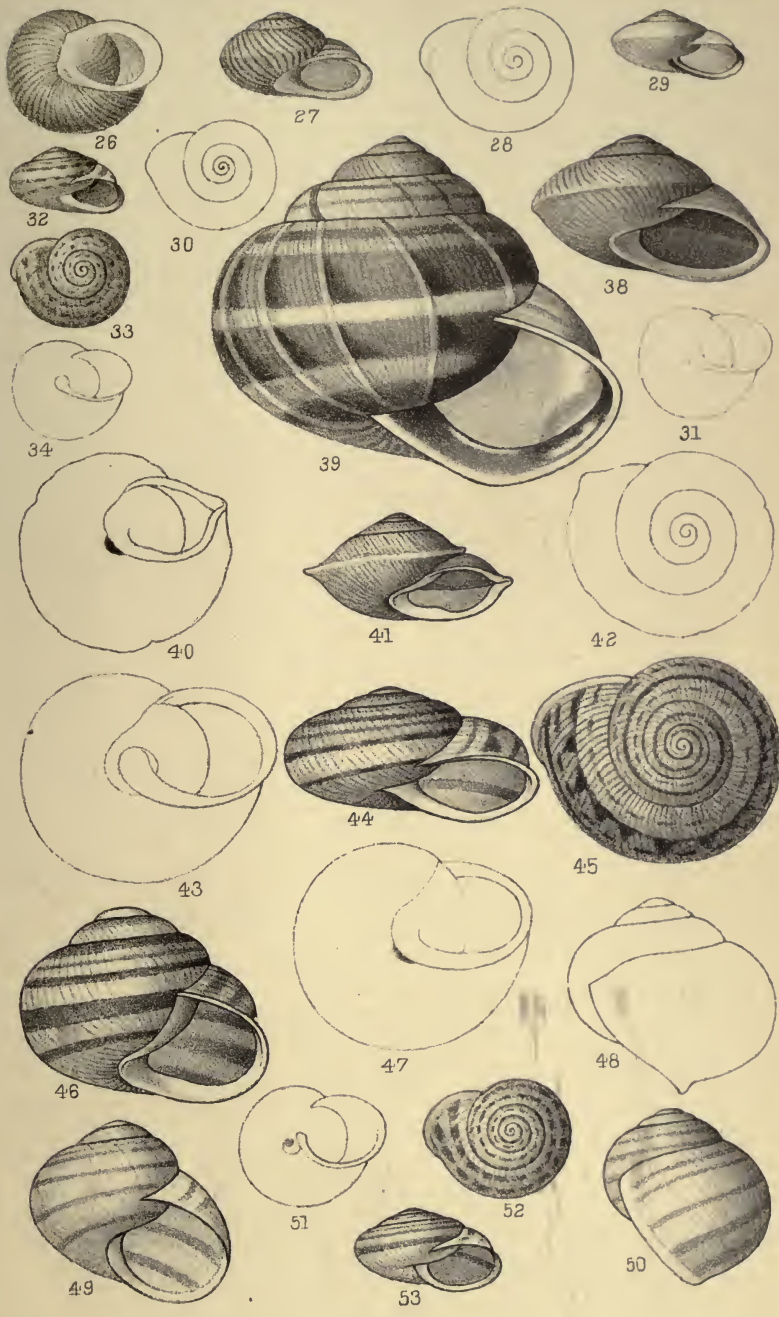
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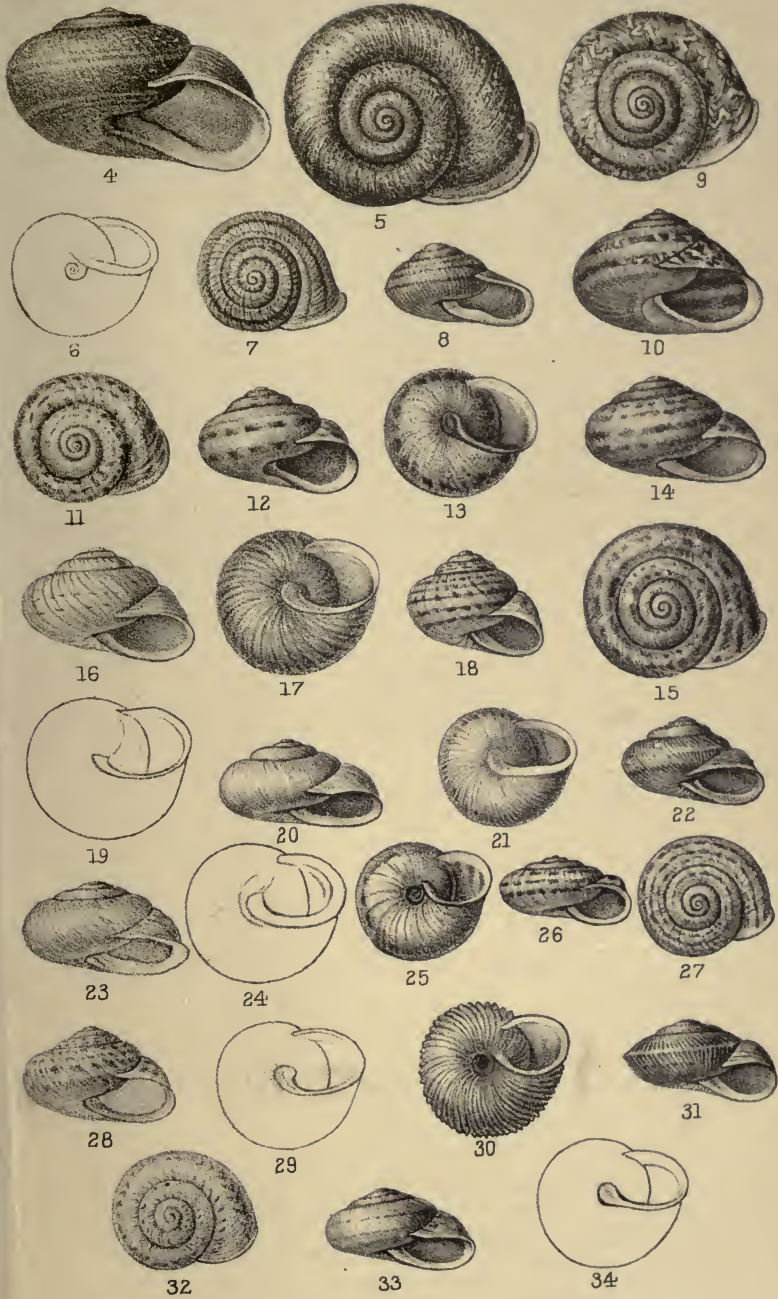
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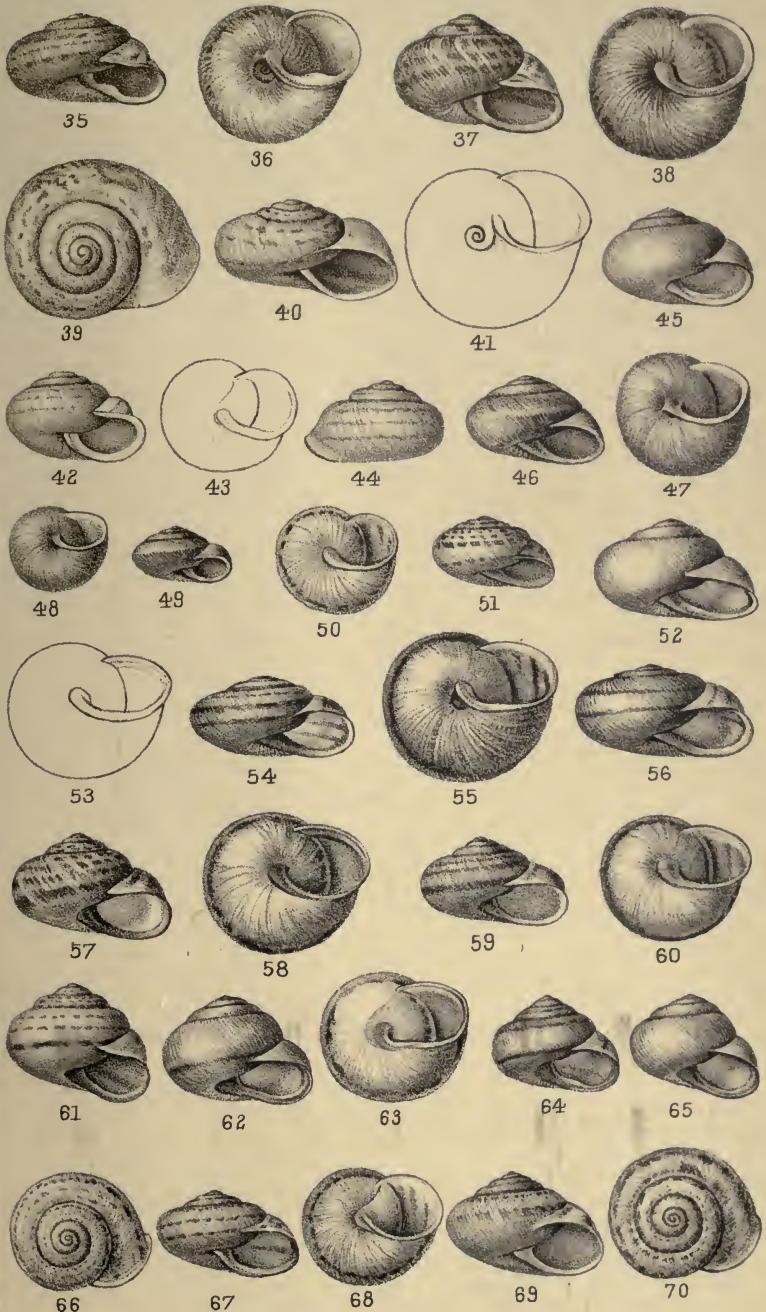
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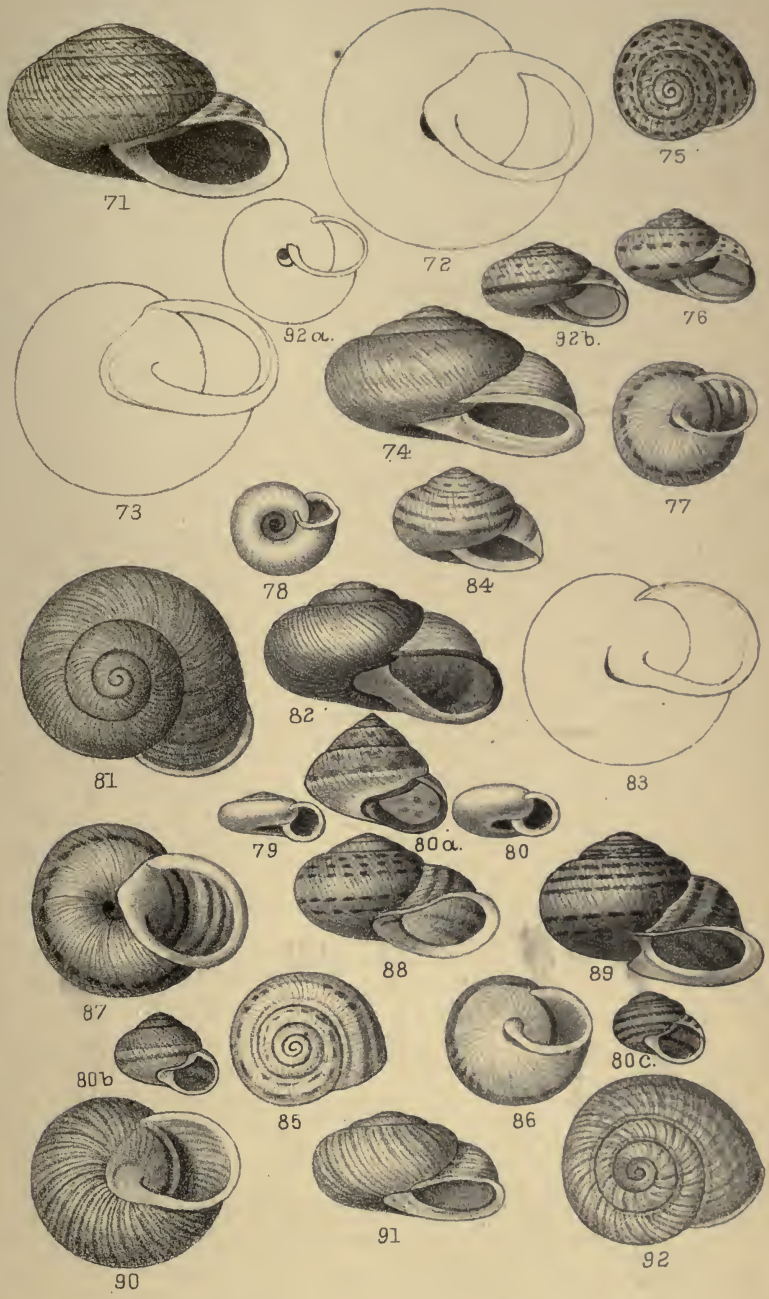
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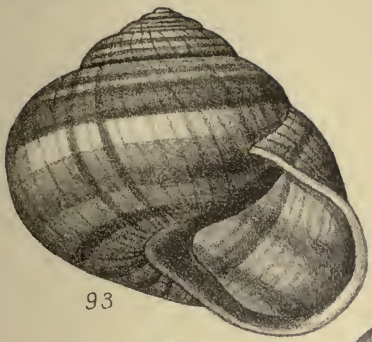
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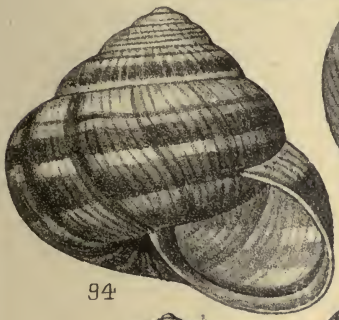
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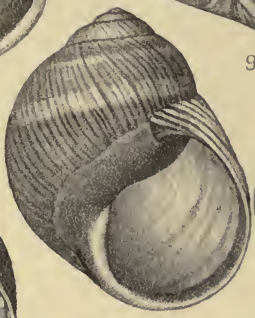
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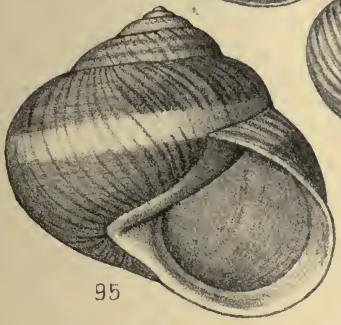
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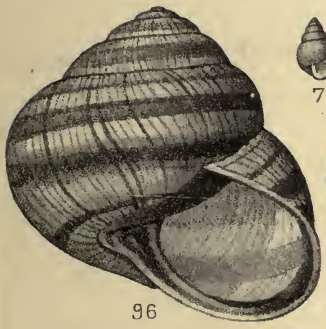
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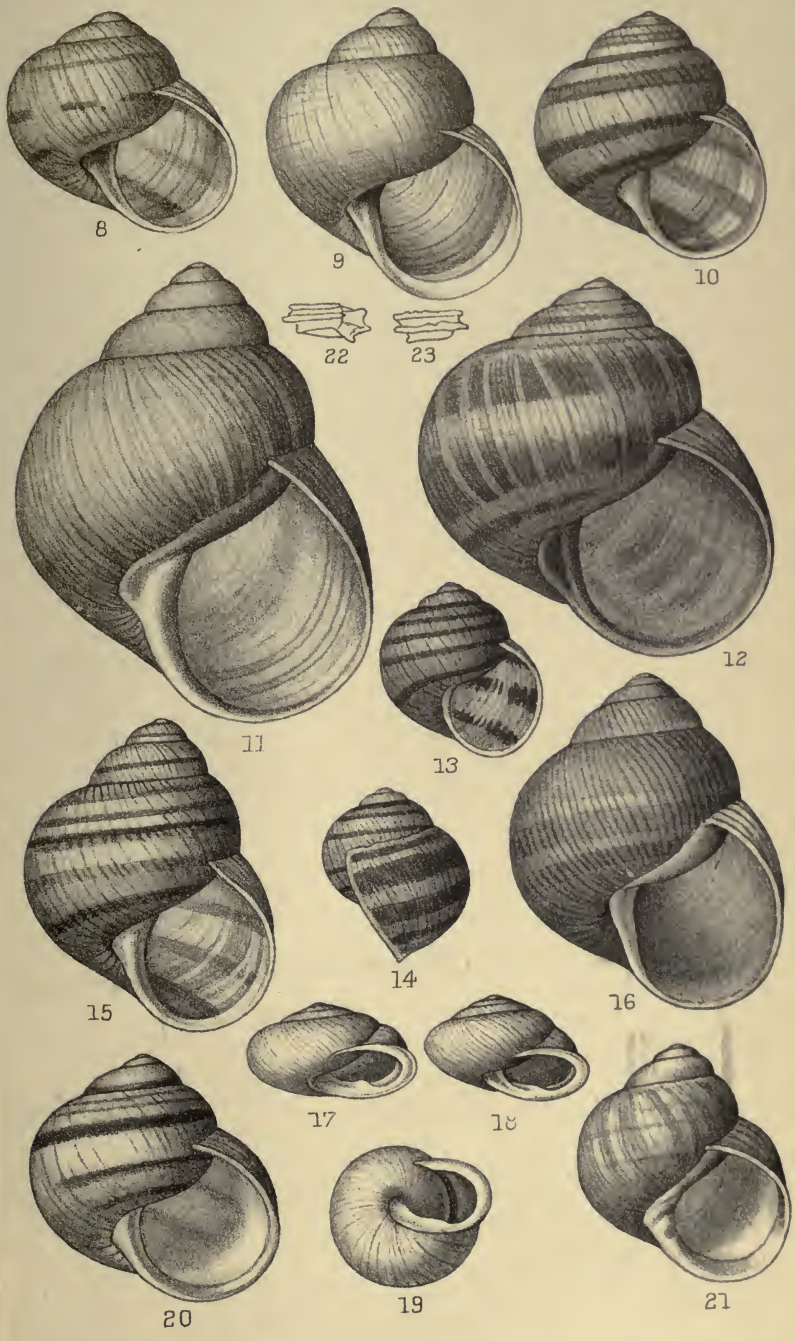
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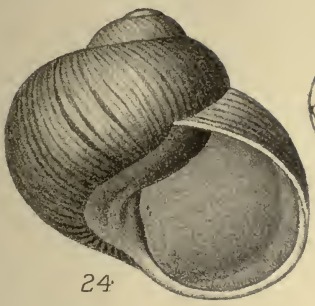
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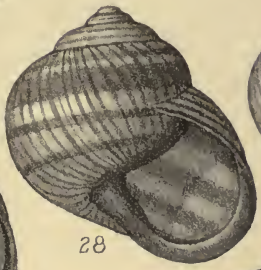
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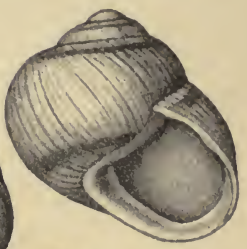
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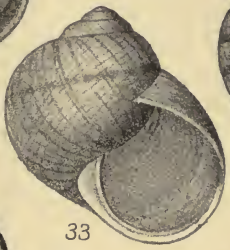
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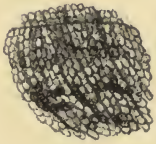
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